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Incombustible Smut Machine.

Machines of some kind for separating smut from grain are indispensable adjuncts of the modern flouring establishment, and the perfection of the flour of commerce is due, in a great degree, to these inventions. The action is always mechanical, and consists in a species of scouring and winnowing of the grains. Ordinary smut mills, however, are so constructed as to allow of an accumulation of smut and dust about the step of the rapidly rotating cylinder, and the exterior being of wood, many fires have occurred by the combustion of the whole, due to the heat evolved from friction.

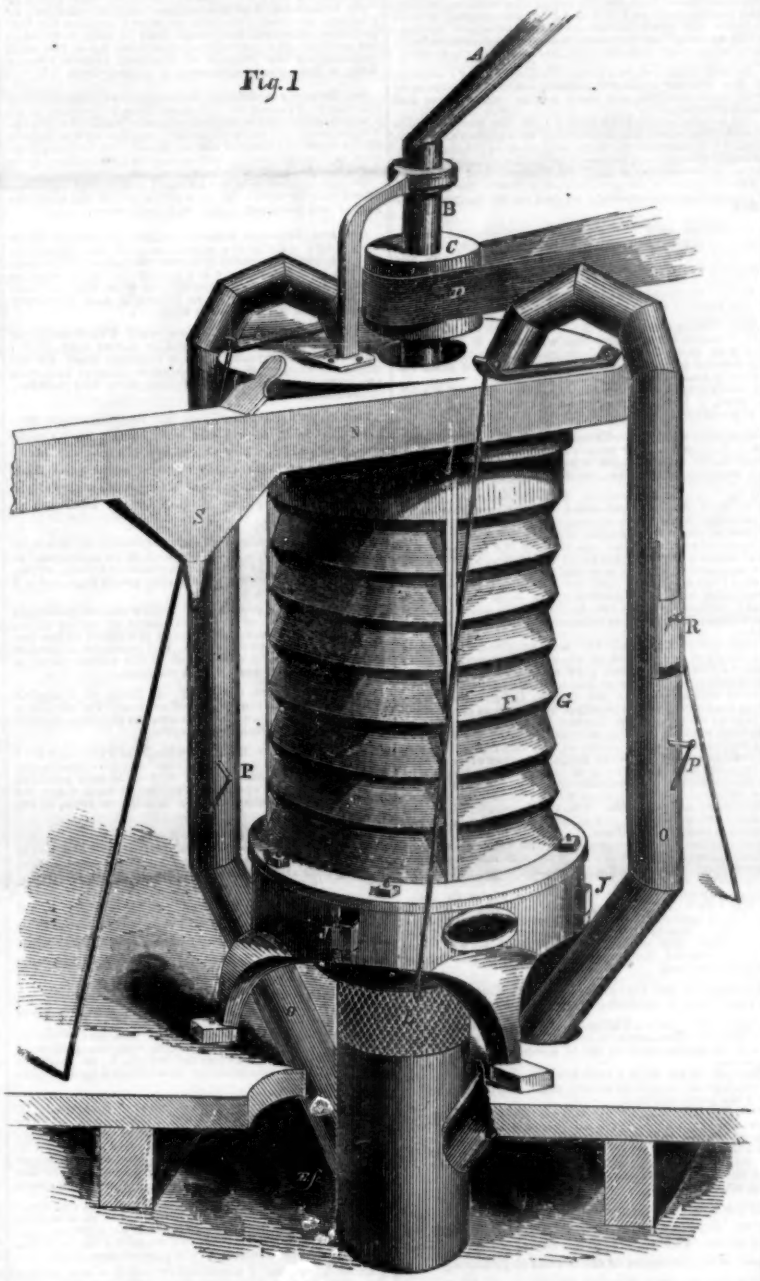
Jonathan L. Booth, of Cuyahoga Falls, O., patented, Dec. 18, 1855, the form of smut mill represented in the accompanying engravings, which is acknowledged far superior to the ordinary smut mills, on the score of perfect safety from fire. Fig. 1 is a perspective view, and Fig. 2 a vertical section. All the parts are of metal, and the step is mounted in a spider frame, the arms of which are hollow, the better to allow a perfectly free communication of oil from the exterior. The whole is admirably ventilated, and its action is very perfect.

The mill consists, like ordinary smut mills, of an upright frame or cylinder, rotating rapidly within a case, and ventilated by a fan attached. A is the feeding spout or hose, through which the grain is supplied, B is the vertical shaft, hollow at its upper extremity, C is a pulley, and D the driving belt. E is a cross tube, which allows the discharge of the grain through the hollow top of B. The exterior of the case is represented by the two letters, F G, being ridged around as represented. F is the upper and G the under side of each ridge. The interior of the inclined portions, F, are corrugated or grooved in lines proceeding up and down the inclined interior. H represents curved pieces corrugated vertically along their exterior faces, and fixed on the interior cylinder, H′, which latter is connected to the shaft, B, by arms, as represented, and necessarily revolves with it. I represents horizontal plates which extend around the cylinder, and revolve with it. J is a hollow tube or radial frame, which supports the step of the shaft, B, and conveys oil thereto, from the exterior.

The rapid rotation of the pulley, C, expels the grain through the horizontal cross tube, E, and throws it with great violence against the corrugations on the interior of the outside case. These corrugations on the interior of the inclined surfaces, F, effectually destroy the motions of the grains thus projected, thereby imparting another shock thereto, and compel them to drop quietly upon the inclined surfaces, G, from which they are deflected inwards, and exposed to the action of the next set of curved pieces, H, below. These, in their turn, impart another smart blow to the grains, and cause them to impinge anew against the corrugations on the interior of the case, a stage below that where the previous effect was produced. This operation is repeated, each grain being alternately projected against the corrugations on the interior of F, then descending is deflected inward by the inclined surface of G, and again exposed to the action of H. The horizontal plates, I, simply prevent the possibility of any grain descending vertically through the whole machine, and compels each grain to pursue the zigzag course described, exposed to the violent percussion, first from the rotating, and next from the fixed surfaces.

BOOTH'S INCOMBUSTIBLE SMUT MILL.

Fig. 1

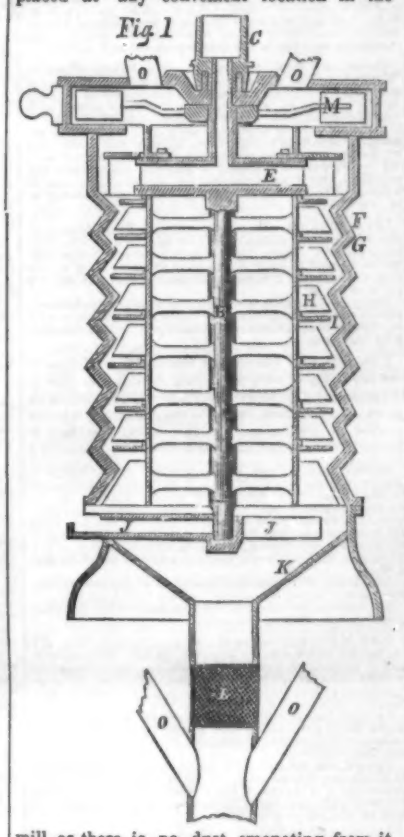


K is a hollow inverted cone suspended below the working portion of the machine. L is a large tube below, containing a cylindrical sieve, introduced as shown, to allow the free admission of air, but to prevent the escape of any grains which might chance to be thrown laterally. M is a fan at the top, mounted on the shaft, B, and receiving motion therefrom. N is a discharge passage extending tangentially from the periphery of the case which encloses M. O are side tubes leading from the lower portion of the sieve tube, L, to the central portion of the fan on its upper side. The action of M draws air from its own interior, and expels it through the passage, N. This air is received through two channels; one, the most important, is a current flowing inward through the sieve, L, and upward through the annular space between the revolving cylinder, H′, and the case, F G. This exposes the grains in their passage downwards through the mill, to an upward draft of air, which carries off all the dust as fast as separated therefrom. The side pipes, O, also deliver a portion, which is drawn from a lower point. P represent the handles of throttle valves, or dampers, by which the movement or draft through the tubes, O, can be easily controlled, and R represent doors or openings in the side of O, which admit air freely to supply the fan, should the upward draft through the mill be found so strong as to prevent the sufficiently rapid descent of the grains. The flow of air through O is beneficial in two respects; it furnishes the means for controlling the upward draft through the mill proper, and also insures a sufficiently powerful upward draft through the lower portion of the tube L, to suck up any very light or false grains which may be mingled with the heavy ones. The effect is, therefore, to discharge through the bottom of the tube, L, all the sound and heavy grains in a condition perfectly clean or scoured, and to eject through the passage, N, a current of air loaded with dust or smut, and also with light grains, if any such there be. S is a pocket or space provided on the lower side of N, in which the light grains may lodge, and be withdrawn at intervals by opening a door at its lowest point.

This smut mill is already in quite extensive use, and has so far proved entirely free from all danger of heating of the bearings, while it is obvious that, should such heating occur in consequence of careless management, no danger to the building could ensue.

It will be seen that the machine can be placed at any convenient location in the

Fig. 1



mill, as there is no dust emanating from it except through the spout, which can be extended to any distance from the mill, throwing all the smut dust entirely out of the mill, and requiring no separate room or enclosure for its reception.

For further particulars the inventor may be addressed at Room 42, Depot Buildings, corner of Elm and Franklin sts., New York.

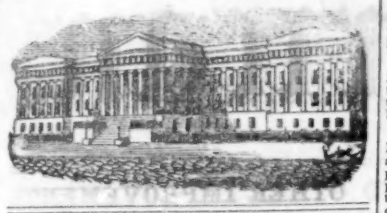
The "Madeira Pet."

The arrival of the *Madeira Pet*, which we last week alluded to as having performed a voyage direct from Liverpool to Chicago, was announced on 'Change by the President of the Board of Trade, and a series of resolutions were offered and passed by that body, congratulating the captain, consignees and others interested in the successful voyage made. The captain was introduced to the Board, the members of which received him with enthusiasm, while he made a few remarks relative to the success of the trip.

A committee was despatched with a steamtug, who had the schooner towed up from the mouth of the harbor to the dock near the Board of Trade rooms. As she neared the dock, with a number of British ensigns floating from her rigging, she was received with three cheers by those on shore. She is but a small schooner, having brought over a cargo of only 240 tuns. Her grain capacity is some 8000 to 10,000 bushels. She was built at the Isle of Guernsey for the fruit trade between London and Madeira.

Christianity and Science.

Professor Joseph Henry, the distinguished head of the Smithsonian Institute, testifies that he knows but one man among the scientific men of the United States who is an infidel.



[Reported officially for the Scientific American.]

LIST OF PATENT CLAIMS

Issued from the United States Patent Office

FOR THE WEEK ENDING JULY 28, 1857.

FEED FOR SAWING MACHINES—Thomas J. Alexander, of Westerville, Ohio: I claim the combination and arrangement with a reciprocating feed carriage, A, as a means of operating the same to effect the reciprocating travel or feed by propelling gear therein, or connected therewith, operated by or from a main feed shaft, C, of the freely-sliding or self-adjusting pulley frame, G, with its right and left hand belts, d e, driven and communicating motion to the main feed shaft, C, essentially as set forth, for the purposes specified.

DRIVING CIRCULAR SAWS—Thomas J. Alexander, of Westerville, Ohio: I claim the combination and arrangement with the revolving saw or cutter, having either a fixed or reciprocating relationship or action in the path of its cut, of the freely-sliding or self-adjusting loose pulley carrying frame, F, made whole or divided, and rigid or self-stretching with its loose pulleys, D D' E E', right and left hand belts, e f, and pulleys, B C, of the saw and counter shafts, essentially as specified, for operation together in the manner set forth.

GOVERNOR FOR WINDMILLS, &c.—Ethan Allen, of Worcester, Mass: I am aware that the employment of a centrifugal governor to regulate the stroke of a pump or the amount of work, by the available power of a windmill is not new. This, therefore, I do not claim.

But I claim in combination with the adjustable or expanding crank, the projection, U, attached to the slide or the crank pin, the sliding rod, W, upon which it acts, for the purpose of engaging a grooved collar upon the spindle of the governor, whereby its adjusting power is confined within a certain proper range, substantially as set forth.

FUZE-MAKING MACHINE—Albert F. Andrews, of Avon, Conn.: I claim, first, The admission of a blast or compressed air upon, into, among, or through the powder on its way through the passage or channel by which it is conveyed to the fuze, substantially as and for the purpose set forth.

Second, Giving the feeding tube a rotary motion outside of a conducting tube, and inside a laying piece, both of which are stationary, substantially as and for the purpose specified.

[Mr. A. is well known as a manufacturer of some of the best and most uniform blasting fuse in use. One of the principal difficulties heretofore experienced in its manufacture has been caused by the great friction of the powder in running into the fuse, and its tendency to lump. This invention obviates the evil very perfectly.]

SEGMENTAL TRUSS FOR BRIDGES, &c.—George S. Avery, of Lewisboro', N. Y.: I claim an improvement in segmental truss bridges by a combination of the arched top chord, horizontal bottom chord, X braces, vertical tie rods, packing blockings, and self adjusting shoes, the whole constructed as described, into a segmental truss of greater strength and stability than such as are generally used with the same amount of building material.

I distinctly disclaim the invention of the several devices taken in the construction of my bridge trusses.

But I claim the combined arrangement of the different parts, as described and set forth.

PILL MACHINES—James C. Ayer, of Lowell, Mass.: I claim the corrugated or grooved globule cylinders, F and G, or their equivalents for forming the rods of mass or semi-solid material into globules, when constructed, arranged, and operated essentially in the manner and for the purposes set forth.

I also claim the cylinder, H, plunger, A2, and screw, k, for forming the round rods, D2, of the desired size, arranged and operated substantially in the manner and for the purposes set forth.

I also claim the knife, F2, or its equivalent, for cutting the rods, D2, of semi-solid substance, the desired length, so arranged as specified that it will cut or sever the rods D2, without sticking to them, essentially in the manner and for the purposes set forth.

LATHE FOR TURNING IRREGULAR FORMS—Samuel N. Baker, of New Haven, Conn.: I do not claim the use of cutters moved and adjusted by a pattern die or guide to give shape, form and figure to moldings or other configurations upon articles to be turned in a lathe.

But I claim first, The use of a series of cutters secured to a cutting head standing at right angles to the article being turned, the said cutters being operated by being revolved within the circular case, B, as and for the purposes set forth.

Second, The use of a pattern guide or die, or of a series of them, placed at right angles to the article being turned, within a circle struck from the center of the lathe, and having a movement in the direction of the length of the lathe coincident with that of the cutter described, and against which the cutters in their revolution come in contact, as and for the purposes set forth.

Third, The use of a sliding cutting head containing both the cutters to perform the operation of turning, and the pattern dies or guides to control the movements of the cutters as described, and for the purposes set forth.

TANNING COMPOSITIONS—Ira Carle, of Kingston township, Pa.: I claim the use of hemlock or oak bark, nitric acid and Glauber's salts, all to be used in one bath, for the purpose of tanning leather from hides in a short space of time, as set forth.

AUGER HANDLE FASTENING—Wm. N. Clark, of Chester, Conn.: I claim the attachment of the nut to the handle of the auger in the manner above described, for the purpose of preventing the parts from being lost, and to form a secure and convenient fastening, as set forth.

SHUT MACHINES—Everard M. Clark, of Lancaster, Pa.: I am aware of wings being attached to a vertical shaft operating in a grooved concave or cylinder for scouring purposes. But this I do not claim.

I claim the shape or construction of the fluted propeller, F, as described, for the purposes of scouring the grain, and at the same time driving a blast upwards, so as to blow off the cheat, smut, &c., out of the spout, B, above, before the grain passes down on to the wings of the propeller, F, and concave, E.

PENDULUM LEVELS—Calvin Cole, of Tarrytown, N. Y.: I do not claim the use of a pendulum to give indications of level or angular surfaces.

Nor do I claim the use of a spirit level disconnected from the combination in which I use it

But I claim first, The adjusting platform, H, with its attached set screw, J, and spring, K, as described and for the purposes set forth.

Second, The adjustment of the dial plate around the axis of the pendulum, by the set screws, D D', as described.

SAWING AND DRESSING STAVES—Elisha K. Collins, of Cambridge, Mass.: I do not claim the employment or use of a band saw, separately considered, or irrespective of the arrangement shown.

But I claim the band saw or saws, F, endless chain, C, which gives a continuous feed motion to one or more beds or plates, I, attached, curved bars, a a, the rotating cutters, v v, the racks, f f, and the gearing, d' d' F, and screws, c', connected with the bar, a', when they are arranged and combined to operate conjointly, as shown, for the purpose of sawing, jointing and dressing staves at one operation, as set forth.

[This ingenious combination produces staves completely shaped without bending or in any way straining the material.]

ARTIFICIAL LEGS—B. H. Nicholas and Douglas Bly, of Rochester, N. Y.: We claim the use of the ball, B, in the manner described, the two sections of the limb being held together in the manner set forth.

TEMPERING SCYTHES—C. P. Crossman, of Warren, Mass.: I claim the employment within a suitable water tank, A, of a pair of movable jaws, D, and boxes, b, for the purpose of seizing, holding and conveying the scythe blade, all substantially as described

SHELL ROLLER BED FOR PLANING MACHINES—Geo. Darby and James E. Young, of Augusta, Me.: We are aware that cylinder or revolving cutters, and also that pressure and yielding feed rollers have been used in planing machines, likewise that motion has been applied to the feed rollers in various ways; therefore we do not claim either of these arrangements in connection with our invention.

Nor do we claim the rocker boxes and sliding bars upon which the bed rollers rest.

We claim the combination of the hollow or shell rollers, X X X, with the bevel grooved rollers, R R R, whereby a bevel grooved or straight bed is formed, in the manner and for the purpose as described.

SEAMING SHEET METAL ROOFS—Lucian Fay, of Cincinnati, Ohio: I claim the use of the burring, folding, and seaming rollers, b b' c D d D' d', constructed with or without adjustable elastic bearings, arranged substantially as described, in connection with the movable platform or carriage and operating in the manner specified.

SPARK ARRESTERS—Henry H. Graham, of Paterson, N. J.: I do not claim radial spark conductors, screens or slats, in themselves, nor their use in smoke pipes and spark arresters.

But I claim placing the slats, 1 1, in the vertical sides of the radial spark conductors, e, at a higher elevation than the screens connecting the bases of said conductors, and with the mouths between said slats opening toward the angle between said spark conductors, and in the opposite direction to the accelerated motion of the products of combustion, substantially as and for the purposes specified.

PUNCHING AND SHAPING METALS—George Hasseltine, of Washington, D. C.: First, I claim the punch, b, in connection with the punch, u, constructed and operated as described.

Second, I claim the movable dies, L L, when used in combination with two punches, b u, for the purpose and in the manner substantially as set forth.

MOP HEADS—James S. Harris, of East Poultney, N. Y.: I claim constructing the wire jaws, B B, so as to nearly or quite inclose oblong spaces, substantially as represented and described, for the purpose of more effectually embracing and holding the cloth.

I also claim the pin D, when used in combination with the jaws, B B, substantially in the manner and for the purpose set forth

MORTISING CHISEL—Christian J. Heistand, of Rapho, Pa.: I claim the new article of manufacture described, consisting of a chisel with a handle placed at right angles with the cutting part, for the purposes set forth.

GOVERNOR FOR ENGINES, &c.—Frederick W. Howe, of Newark, N. J.: I am aware that the arrangement of wheels described has been employed to regulate the admission of steam to an engine or water to a wheel, for the purpose of regulating the velocity by the motion of the intermediate wheel, induced by the difference between the motion of the motor and that of the governor.

And I am also aware that the centrifugal force of the pendulum ball of a governor has been employed to make friction to retard the motion of the governor, and the differential motion to regulate the supply of steam or water.

I am also aware that it has been proposed to regulate the supply of steam to steam engines by an arrangement which enables the fly ball governor, by an intermediate mechanism, to increase or decrease the throw of the eccentric which operates the valves; the governor slide being connected with a friction brake, so as to increase or decrease the friction thereof, to make it greater or less than another friction, thus determining the throw of the eccentric by the relations of the two frictions determined by the position of the fly balls as they are elevated or depressed by the velocity of the engine; but it will be seen that the arrangement and combination of these are materially different from what I have described as constituting my invention. I do not, however, wish to be understood as making claim broadly to the modes of operation above pointed out

But I claim the arrangement of the vertical shaft receiving motion from the motor by the differential motion, substantially as described, to regulate the supply of steam to an engine, or water to a wheel; the said shaft having arms, to which are suspended the arms of the fly balls, provided with cam-like projections, in combination with the sliding cap on the shaft, the friction cone feathered to the shaft, and fitted to a conical cavity of the column or standard, and the spring interposed between the friction cone and the cup, substantially as and for the purpose specified.

FASTENING BREASTPINS—Charles F. Kolb, of Philadelphia, Pa.: I claim the improvement as specified.

CLEANING RICE—Philip R. Lachicotte and T. B. Bowman, of Charleston, S. C.: We do not claim separately the employment or use of a screw for the purpose specified.

Neither do we claim a cylinder in connection with the screw, irrespective of its arrangement, and its connection with the parts specified.

But we claim the rotating and adjustable cylinder, F', provided with the screw or spiral flanches, f g, and placed within the cylindrical case, A, in combination with the stationary wings, E E, attached to the bar, D, on the bed, B, the wings being within the cylinder, F, and the whole arranged substantially as and for the purpose set forth.

[This machine very effectually cleans the flour or "scrof" from the grains of rice after being hulled, and in a manner which allows of the degree of friction on the grains being increased or diminished at pleasure.]

MORTISING AND BORING MACHINE—J. M. Jay, of Canton, Ohio: I claim the arrangement of the rack, E, adjustable brace, segment slide, rack, G, and slide table, and in combination with the parallel linked table screws, b b, swivel nuts, a, and arms, f f, in the manner and for the purpose described.

MASTIC ROOFING COMPOSITIONS—Samuel K Lighter and James A. Morrell, of Hamilton, Ohio: We claim the roofing compositions described, composed of the several substances in substantially the proportions specified, prepared and used in the manner set forth.

SPARK ARRESTERS—Ethelred May, of Boston, Mass.: I do not claim combining with a chimney of a railway locomotive steam boiler, woven netting to prevent the escape of sparks and cinders therefrom

Nor do I claim arranging a perforated or woven wire cone in a chamber placed over a smoke box of a locomotive engine boiler, and made to communicate with such a flue, surrounded and being concentric with such chamber, the same being shown in the patent of R. A Wilder, dated October 31, 1854.

Nor do I claim surrounding the exhaust pipes with two cylinders, perforated or not, and having the outer one connected with rings, with the side of the smoke arch as described in J. Williams' patent of March 6, 1855.

Nor do I claim prolonging an unperforated tubular smoke stack down to near the bottom of the smoke box, and providing it (the said stack) with one large opening for the reception of the smoke and products of combustion.

But I claim my arrangement of the spark arrester within the smoke box of the locomotive steam boiler, so that the stack or chimney shall be prolonged down into the smoke box, and made of wire gauze or perforated plates, and otherwise so constructed as specified, that the entire track of the smoke shall be through the gauze or perforated plates.

SPINDLE FOR DOOR KNOBS—Orrin Newton, of Pittsburg, Pa.: I do not claim as new the use of notches in the spindle, nor the use of a key to connect the spindle and shank.

But I claim the arrangement of the notches on the spindle of the door knob in alternate positions on opposite corners or angles of the squared spindle, in combination with the key, constructed as described, and the deep and shallow groove in the shank, together with the depression in the circle plate to keep the key in place, for the purpose of adjusting the length of the spindle of door knobs to different thickness of doors, by gradations sufficiently minute to answer all practical purposes, and for other purposes set forth substantially as described.

LIME KILNS—John McGregor, of Selma, Ala.: I claim the particular arrangement of the furnaces or fire chambers, K K K, in relation to each other, and to the square chamber, C, when the same are constructed and used in combination with the draft holes, d d, and fire flues, M, in the manner and for the purpose herein set forth and described.

PROJECTILES FOR SMOOTH BORED GUNS—John L McConnell, of Jacksonville, Ill.: I claim the improvement of the projectiles known as "egg shaped," which consists in so grooving the surface as described, that when discharged from any smooth bored gun, with the larger end foremost, the combined effects of the center of gravity being in front, and the grooves (acted upon by atmospheric pressure) shall give to the projectile an accuracy of flight when so fired, similar to that produced by the rifle, and approximating thereto.

LIME KILNS—Clark D. Page, of Rochester, N. Y.: I claim the combination of the primary grates, G, and the secondary grates, r, with the plate, B, and tubular flue, T, when the same are arranged to operate in relation to each other, in the manner and for the purpose set forth.

FASTENINGS FOR CARPETS—Washington H. Penrose, of Philadelphia, Pa.: I claim the use of bars, strips, or rods, with teeth or points, either straight, inclined, or hooking, fastened to the floor on which to place the carpet, in combination with strips, bars, or rods, fastened to the wash board to press the carpet down upon the teeth or points, for the purpose of retaining carpets upon a floor, in the manner substantially as described.

BIT BRACE FOR BORING OBLIQUELY TO THE STOCK—Charles C. Plaisted, of Chicopee, Mass.: I claim a bit stock in which the socket, or part that holds the bit, revolves about its axis in an oblique position with reference to the stock by means of the universal joint, or its equivalent, and the adjustable connecting link, extending from the socket to the stock.

In combination with the above, I claim the cylinder or coupling by which the axis of the bit and the stock are placed and retained in line with each other,

RAISING SUNKEN VESSELS—John Ponton, of New York City: I claim the arrangement of the adjustable and chargeable supports, D D, operating alone or in connection with the slides, e e, whereby the tanks may be brought more closely in connection with, and the sustaining power of them more generally and uniformly distributed along, a vessel or body.

VALVES AND PASSAGES TO THE CYLINDERS OF STEAM ENGINES—John A Reed, of Jersey City, N. J.: I claim the employment in each cylinder head for the induction, cutting off, and eduction of steam of two ring valves with an arrangement of seats, ports, and passages, substantially as described.

This invention accomplishes the very important purpose of reducing the waste or loss of steam in the ports almost to nothing. The valves are let into the inner faces of the cylinder heads so as to come quite flush therewith, and are capable of giving, with a very slight movement, a very free opening for the admission or escape of steam.

GUARD FINGERS FOR HARVESTERS—A R Reese, of Philipsburg, N. J.: I do not wish to be understood as claiming broadly the use of steel plates or cutting edges, as applied to cast or malleable iron guard fingers, for I am aware that such use is old.

But I claim the combination with a cast or malleable iron guard finger of the steel plates or cutting edges, M M, when the same are united to the finger in the peculiar manner above described, and arranged to operate in relation to each other, and to the cutters as fully shown in fig. 5, for the purpose set forth.

TREATING PAPER STUFF—J. A. Roth, of Philadelphia, Pa.: I claim the combined application of sulphuric acid upon woody fibres, with that of the chlorine bleaching agents, substantially as described,

DRILLING ROCK—M. F. Rowlands, of Pittston, Pa.: I claim the combination of the vibrating centrifugal hammer, with the rotating spring W, and loosely attached drill V, arranged to operate in relation to each other, for the purpose of facilitating the drilling of rock, as described.

FASTENINGS FOR CARPETS—R. E. Schroeder, of Rochester, N. Y.: I claim the plate, C, secured to a stock, B, or directly to the flooring by a joint, the plate having a spring D, bearing against it, substantially as described for the purpose set forth.

[This is a fastener and stretcher combined. By its aid the heaviest carpets, such as Brussels tapestry, may be laid or removed very rapidly and perfectly, and without any of the liability to injury produced by the ordinary method of fastening with tacks.]

CORN PLANTERS—Chas Schnepf, of Lancaster, Pa.: I am aware that shovels and teeth are attached to slides for planting corn; but these I do not claim.

I claim the semi-circular shaped scooping hoes, F, with jointed ends E, in combination with the sliders, K, and operated by the revolving levers, C, as arranged and constructed substantially as described for the purposes set forth.

RECEIVING BOXES FOR PASSENGERS' FARES—J. B. Slawson, of New Orleans: I claim the method set forth of preventing fraud upon proprietors of public conveyances on the part of conductors, drivers, or passengers, by means of the plate or apron f, glass plates, c and d, lever G, and drawer I, when arranged and operating in the manner substantially as and for the purposes described.

HEMP BRAKES—Stephen Stafford, of Carrol co., Mo.: I claim, first, Arranging a series of swords in a sash at unequal distances apart and parallel to each other, the spaces between them decreasing from the upper to the lower sword of the series, for the purpose described.

Second, Arranging a series of swords in a sash, so that the edges of the under sword will project beyond the edge of the sword next above it throughout the entire series for the purpose described.

Third, The combination of the swords in the stationary sash, with those in the movable sash, when arranged respectively in each sash in the manner described.

PARING AND SLICING APPLES—R. W. Thickins, of Brasher Iron Works, N. Y.: I do not claim broadly paring and slicing apples at one and the same time for implements for effecting the same purpose have been previously invented.

But I claim the two arbors, Q Q, attached to the rotating head, P, when used in connection with the screw shaft, F, collar, c, with arms, h d, attached, the rack, J, and geared segment K, to which the knife arm, L, is attached, the above parts being arranged substantially as shown for the purpose specified.

I do not claim separately or in themselves considered, the employment or use of sliding tubes placed over or on the forks for the purpose of automatically discharging the cores therefrom, for such tubes have been previously used, and the same may be seen in the paring machine patented by J. D. Seagrave, April 18, 1854, I therefore distinctly disclaim all parts or arrangement of parts covered or claimed by said Seagrave, and I confine myself to the precise arrangement and combination of parts specifically as shown and described.

What I do claim, therefore, is the sliding tube, S, and lever, U, with curved arms, v, attached, when combined with the arbors, Q Q, arranged as shown, so that by the same movement of the head, P, the several parts are made to work automatically as set forth.

[The machine appears one of the most rapidly and most easily operated which can well be conceived. The arbors carrying each an apple on its respective fork are automatically changed in position, so that while one is being pared the other is being sliced.]

OSCILLATING STEAM ENGINES—John Wallace, of Pittsburg, Pa.: I wish it to be distinctly understood that I disclaim all such means that have been used before for adjusting and keeping up the "side pipe" against the seat surfaces on the cylinder, such as set screws, gib and key, or any other devices which allow no yield to the side pipe.

But I claim the use of the elastic wedges, A A, in contradistinction to the above mentioned unyielding devices, and as an improvement thereon, when constructed and arranged and operating on the side pipe, substantially as described and for the purpose set forth.

STUFFING HORSE COLLARS—J. C. Tobias, of Lincoln, Ill.: I do not claim separately or in itself considered, the device formed of the two racks, G H, gearing alternately into the pinion J, for the purpose of communicating a rectilinearly reciprocating motion to the rods or plungers from the continuously rotating driving shaft, for such device or its equivalent has been previously used for similar or analogous purposes.

But I claim attaching the rods, D E, to a vertical bar, F, which is attached to the slide, B, and to the racks, G H, into which the pinion, J, by the means shown or its equivalent, is made to gear alternately, whereby the stroke of the rods or plungers, D E, may be cut off at any desirable point, and their reciprocations accommodated to the gradual filling up or stuffing of the bulge or rim of the collar, as set forth.

[In the machines that have been previously employed for this purpose long straw is supplied to all parts, but experience demonstrates that a perfect collar cannot thus be produced. In this invention, both long and short straw is rendered easily applicable, the short being employed to stuff the "bulge," and the long straw the rim. The operation produces a very perfectly stuffed collar.]

REVOLVING FIREARM—Jas. Warner, of Springfield, Mass.: I claim the specific device in the end of the slot for preventing the retreat of the lever, b, in the act of cocking, substantially as set forth.

EDGE PLANE FOR BOOT AND SHOE SOLES—Charles Warren, of Putnam, Conn.: I do not claim broadly the employment of a screw for adjusting the cutters in boot edge planes, nor do I claim broadly the placing of both of the cutters in grooves. both of these features may be seen in the patent of Hill and Arnold, 1848.

I claim as a new article of manufacture a boot edge plane, which has its cutters, E E', secured between caps C D, and a central plate, D, substantially as described.

[In this convenient device the cutter is held in hollow, adjustable caps on the guide plate, which allow the cutter to stand at a smaller angle than usual with the surface to be smoothed, and also to be removed with great facility for the purpose of sharpening.]

SHINGLE MACHINE—E. Webber, of Gardiner, Me.: I claim, first, The combination of the vibrating frame, 2, with the obliquely grooved slide piece 11, and the cam wheel, 12, arranged and operating substantially as and for the purpose set forth.

Second, The relative adjustment of ratchet, O, and sheave g', substantially as and for the purpose specified.

Third, The arrangement of the pinions, 7 7, with levers 7' 7', and dogs, 6 6, as set forth.

FEEDING THE BOLT IN SHINGLE MACHINES—Wm. Wood, of Westport, Conn.: I am aware that in shingle machines of this description the bolt has been previously fed obliquely forward, the ends of the bolt being actuated or moved alternately; and I therefore do not claim in the abstract, or irrespective of the means employed for effecting the purpose such movement of the bolt.

I claim, first, The employment or use of two screws, H H, actuated alternately from the knife frame, D, through the medium of the lever E, rod K, arm n, of the sleeve or collar, J, disk i, provided with ratchet-shaped projection, m, and teeth or cogs, l, and the plate M, the whole being arranged substantially as and for the purpose set forth.

I further claim the plate, M, when arranged and applied to the bar, G, substantially as shown, so that it may be readily disengaged from the screws when desired for the purpose specified.

[This relates entirely to that class of shingle machines which operate by a reciprocating knife, and is a very simple method of feeding up the bolt.]

GATE LATCH—A. E. Morgan (assignor to himself, David Todd, and B. Waddle) of Poughkeepsie, N. Y.: I am aware that in Loudon's Encyclopædia of Agriculture, (page 502,) there is described a gate fastener composed of two separate swinging bolts.

I do not claim broadly to be the first inventor of vertically moving bolts or latches. I particularly disclaim the latch now in use on the southwest gate of Lafayette square, Washington, D. C.

I claim the arrangement and combination together within a suitable case, A, of a pair of vertically moving locking bolts or bars, b b, with a horizontal thumb bar, C, as and for the purposes described.

[This improved catch applies to that class of gates which are so arranged as to swing in either direction. Ordinary fastenings on such gates do not catch when the gate is swung violently. This is the evil which this device is particularly designed to overcome.]

CULTIVATORS—Harrison Ogborn, of Greensfork, Ind., and Geo. Taylor, of Richmond, Ind., assignors to Harrison Ogborn, aforesaid: Now, we do not claim the combination of a crank axle tree extending across the center of the frame, on the ends or cranks whereof are mounted the sustaining wheels, the same being for the purpose of raising and lowering the frame of the cultivator as shown and described in D. B. Rogers' patent of January, 1849.

But we claim the combination of the plow beams, g, g, g, g, with the eccentric axles, F, in the manner and for the purposes set forth.

SASH FASTENER—F. Tarbell (assignor to himself and D. C. Hicknell) of Boston, Mass.: I claim a sash fastener made as described.

[This fastener is self-locking, operates by gravity in a very simple manner, is very strong, and is little liable to get out of order. It consists in a slide in which is an oblique slot which gives motion by a pin therein to a bolt concealed behind it. By pushing the slide upward the bolt is drawn within the case.]

FIXTURES FOR CURTAIN ROLLERS—Lewis White, (assignor to himself and Elisha P. White) of Hartford, Conn.: I do not claim the lever or pulley or any other of the arrangements as new.

But I claim the application of the friction roller, B, for the purposes as set forth, and substantially as described.

ADDITIONAL IMPROVEMENTS.

PACKING PISTONS AND STUFFING BOXES OF STEAM ENGINES—Patrick Clark, of Rahway, N J. Patented June 2, 1857: I claim the above described foil packing, with cloth cemented or otherwise fastened on one or both sides of it in the manner described, and for the purpose named.

GUTTA PERCHA STEREOTTE COMPOSITIONS—Leonardo Westbrook, of New York City. Patented July 19, 1853: I claim the compound of gutta percha, gums, and metallic powders described, combined as set forth, and for the purposes mentioned.

Spontaneous Combustion of Trees.

A singular occurrence is stated to have recently taken place at Chesterfield, Va. In a field adjoining a large meadow, smoke was seen issuing from a decayed portion of a beautiful tree, and afterwards flames were observable, which were with great difficulty subdued. In a short time afterwards the body of another tree in the same field was discovered to be on fire, and defied every exertion that was made to save it; the flames encircled the whole body, until the tree broke off about six feet up. The previous condition of either tree is not stated very fully, nor does it appear exactly how efficient was the fire department which made such heroic efforts to save them.

Management and Precise Value of Peat Fuel.

The following communication from one of the largest wire manufacturers in the country, contains very full and valuable information with regard to the actual amount of heat developed by the combustion of this too much neglected fuel, and proves pretty plainly, by the extensive experience of this concern—the reputation of whose wire stands, we think, considerably higher than that of any other house—that peat may prove an excellent substitute for coal, on account of its freedom from sulphur and any other element injurious to the strength and toughness of iron.

MESSRS. EDITORS—We noticed in your last paper your remarks on peat, a subject which has interested us very much, and about which we have had more experience than any other concern within our knowledge, and which we suppose may not be uninteresting to the public. We will, therefore, give you the result of our experience, that you may make such a disposition of it as you may deem best.

Peat is far more abundant throughout all of the New England States than it is generally supposed to be. In most of our towns there is more or less of it, and we may say many of our farmers have peat without even suspecting it. Some three years since our consumption of wood had become so great (1,200 cords annually) that we were induced to see if we could not obtain a less expensive fuel as a substitute, one that would be equally good for the iron, which we were obliged to anneal frequently in the process of manufacture, when our attention was accidentally called to a load of peat. We hardly knew what it was or where it came from, but on inquiry we ascertained for the first time that we had any quantity of peat in our own city. This led to the purchase of a single cord, which was our first experiment upon what looked to us more like a heap of mud than a cord of fuel. Much to our surprise, when it was put into the furnace, where we had a strong draft, it produced a beautiful white heat, and blazed up nearly as much as seasoned hard wood, a heat constant and intense to a degree which made it look like a coal fire. This induced us to purchase a quantity of peat meadow, to which we have since added, paying at first $50 and now $100 per acre. On this we have erected suitable buildings to contain the peat, and have taken out and burnt nearly two thousand cords, which has been used for annealing our fine card wire, and such other wire as requires the best metal which can be obtained. The effect of this kind of fuel on the iron, we have fancied, has been to improve the quality; of this, however, we cannot speak with entire confidence. We have found by a careful comparison that a cord of well seasoned peat will produce as much heat as a cord of dry oak wood; also that a cord and a half of peat will generate as much steam as a tun of anthracite coal. The cost of cutting out, turning, and putting into the peat houses is $2 a cord—which includes only the labor—being done with a peat knife, which is the most expeditious way. There are some peat meadows where the peat is equally good, but is so free from fibers that the only way is to shovel it out, mix it up like mortar, and make it into any convenient form by moulding; in doing so it will cost nearly twice as much, and is worth one-third more. We find that in our meadows the best of the peat extends down only about four feet, while the whole depth is from four to twenty-five feet, and even more, in some cases; below four feet it is without fiber or solidity.

The best season to commence drying is the first of June—it can be continued until the first of September. This will be quite a sufficient time to get off two crops or cuttings if the meadow is pretty dry and the weather not unusually wet.

In most localities peat may be used to good advantage for many kinds of manufacturing purposes, at a saving of from 33 1-3 to 50 per cent over any other kind of fuel, depending very much on the locality. For culinary purposes it is very doubtful whether it will come into general use. It is, however, used in this city by some families in cooking-stoves and grates, and by many much liked, especially as a substitute for charcoal, to kindle with. It has the remarkable property of keeping fire a very long time; we often find it burning a week under our furnaces after the fire has gone down. It is of the highest importance that it should be very dry that it may burn economically.

ICHABOD WASHBURN & Co.

Worcester, Mass., July, 1857.

The National Exhibition of Agricultural Machines.

MESSRS. EDITORS—You request of me a history or statement of the trial of reapers and mowers at Syracuse, had from the 13th to the 22d ult., but as member *ex-officio* of the "Board of Judges." I have no right to speak *comparatively* of the different machines, or indicate my own preferences, or those of any other members of the board, till the full report is ready for the public, and the time (Sept. 1st., 1857, at Louisville, Ky.,) arrives for promulgating the award. I have found for years in the management of exhibitions of this kind, that when I pleased myself with my own efforts and action, that the exhibitors and the public have also been gratified, and their approbation has followed my own convictions of what was just and proper.

In this last effort I have not fully pleased myself, and I shall bear quietly any note of censure interested or disinterested observers may feel disposed to award, as I certainly am responsible for any lack of system in carrying forward the trial.

You, like me, repudiate the mixing up of military parade and show with civic and particularly with agricultural gatherings and processions, and I believe you and your readers generally will sympathise with my griefs when I attribute all the confusion and irregularities that delayed and spoiled our first two day's operations to the appearance and interference of certain military operations in the shape of big guns, swords, blue coats, epaulets, &c., without any notice or consultation with me, and entirely breaking up and counteracting the plans I had laid for opening the trial, and all the apologies I have to make to exhibitors for submitting to it is that the whole came so suddenly upon us that I had no time to counteract the movements, and not the patience to submit quietly to the intrusion.

I have no right to make your paper the channel for a personal outburst of spleen against the military of Syracuse for their misplaced and misteimed parade on the 14th inst., but I wish you aid me in warning committees of arrangement, wherever they may be located, that by placing the military at the head of mechanical and agricultural processions and exhibitions, they disgust and alienate the men to whom they are indebted for the true glory and advancements of the arts of peace. The pecuniary failure of the New York Crystal Palace enterprise was due in a great degree to neglecting in the same manner the mechanics who were to support it.

The trial of the machines was less satisfactory during the sweepstakes or trial against time than on the trials singly with the dynamometer. Most unfortunately, I think, for the exhibitors generally, they strove to make good time at the expense of good work, and some of our most popular and valuable machines may find that less haste would have worked to their advantage in the final result, as the judges must take the work done at the trial as the standard, instead of what they know many of the machines capable of doing under other circumstances.

I have no doubt that the report will be more extensively noticed and read than any other ever made on kindred subjects. Our means of obtaining the direct and side draught or resistance, were better, without doubt, than ever before applied, and we feel that the application has been fully and honestly made and recorded, and that the public for once will have true mathematical results to guide in the selection of machines, on the publication of which you will be able to select all information you may wish for your journal.

I should have mentioned that Col. Wilder and the officers of the United States Agricultural Society repudiated the military parade alluded to, Col. Wilder himself declining to move with the procession and riding by himself to the fair grounds. His address was emphatic and well timed, and the farmers and artizans who have jointly produced and introduced these important aids in the harvest field had full measure of the honors deserved.

JOSEPH E. HOLMES.

Syracuse, July 25, 1857.

Husking Thimble—Small Inventions and Large Profits.

MESSRS. EDITORS—We are happy to state that we have been very successful thus far in introducing the Husking Thimble, for which you obtained Letters Patent for us on the 13th of May, 1856. In looking over our books, we find that we have sold 75 300, exclusive of those retailed. We have sold these at a price which affords us a profit, over and above the cost of manufacture, of $1600. Judging from present appearances, we expect to have orders for not less than 200,000 this season. You are at liberty to use this as you may think proper.

We have also received $20 in premiums.

J. H. GOULD & Co.

Alliance, Ohio, July, 1857.

[On page 302, volume 11, SCIENTIFIC AMERICAN, may be found an engraving of the invention above referred to, which is simply a thimble with a projection or nail cast on one end. It is one of the most simple inventions we have ever patented—so simple, in fact, that we were in doubt as to advising the inventor to apply for a patent at the time he first submitted his model to us, fearing the Patent Office might consider it lacking in sufficient novelty to warrant its issuing a patent. The sequel is given above over the inventors' signature. They applied for a patent, and obtained it; have already sold over 75,000 of the implements, and the patent has nearly thirteen years yet to run. The owners will no doubt reap a large fortune out of so small an article as a Patent Husking Thimble, which is not much larger than a walnut.

Such testimony of the value of patents is encouraging to inventors, and those who have obtained Letters Patent or contemplate applying for them.

United States Mails very Uncertain.

MESSRS. EDITORS—Can anything be done to remedy my case? I am a subscriber to the SCIENTIFIC AMERICAN, value it highly, and wish to preserve all the papers; but for the past six months I have generally got two numbers and lost one. It comes properly directed and carefully wrapped.

P. J. CASWELL, Supt. Dorn Mines.

Abbeville District, S. C., July, 1857.

[The fault complained of above is wholly due to the mails, and it is certainly very aggravating, not only to the publishers, but also to the subscribers. We are very particular in our mailing department that every paper is regularly sent, and cheerfully supply our subscribers with any numbers that may be lost through the mails, upon being notified. Our ricketty postal system needs revamping, and we hope Postmaster-General Brown will look sharp after it.

Cost of Gumming Saws.

MESSRS. EDITORS—Will you be so kind as to inform me where I can get the best gummer for mill circle saws? It costs me no less than three hundred dollars to get my saw gummed. J. S. WESTBROOK.

Zebulon, Ga., July, 1857.

[It is very evident from the above that the blessings of modern saw-gumming have never reached so far as Zebulon. We have no doubt Mr. Westbrook will speedily hear of several cheap machines for this purpose.

The Scientific Press of Paris.

We learn from our spirited French exchange, *L'Invention*, that the editors and chief contributors of the scientific and medical journals in Paris have commenced a series of monthly dinners. The chief toast at the last was, "The scientific press—and may the extension of its influence spread more and more among the public the taste for scientific pursuits."

Agricultural Machinery and its Results.

Six years since, in Ohio, there were very few agricultural machines—now there are an immense number. The effect of machines in doing the work of men it is hardly possible to estimate.

A mower with two horses, two men, and a boy, must accomplish the work of at least twelve men. If so, it must save the labor of five men at least. Now, we know of one county which has three hundred and fifty mowers and reapers, and they must save the labor of about 1600 men! In the State at large, there must be about eight thousand of these machines, thus saving the labor of 40,000 able-bodied men. Supposing that they are employed only two months in the year, for harvest only, they will save, in money paid for labor, about $2,500,000 per annum. The interest on their cost will be about $70,000 only; so that there will be a net absolute gain on them of more than two millions per annum. If we look to the prairie States, the saving will be much greater. In the United States at large, probably the labor of 3,000,000 able-bodied men is saved during two months in the year. This is equal in money to twenty millions of dollars per annum. This saving, too, is made in the last five years. But the saving of money is by no means the most part of the saving. The economy of labor is, in our modern civilization, of the highest value, without reference to the money or the market value. We have already referred, as our readers will remember, to the tendencies of our present civilization towards centralization in cities and towns. This is really, and without theory, drawing large portions of our rural or country population to the towns. This is diminishing the agricultural laborers while it increases the towns. The consequence is that, both in America and Europe, the relative proportion of cultivators is continually diminished. If we suppose this process to go on like a mathematical series, without arrest, the consequence would be ultimate starvation; but, of course, the preliminary symptoms of such a calamity would be sufficient to drive many from the cities to the country, and thus change the current. Still, we must regard the invention and success of this agricultural machinery as a providential interference to avert for a time the alternative of starving in cities or returning to the country.—*Railroad Record.*

New Lines of Steamers.

The Washington correspondents of the daily papers announce that the Postmaster General is making arrangements for the conveyance of the mail between San Francisco and Puget's Sound in a line of steamers. This line will extend along almost the whole of the Pacific coast of the United States. A mail contract by the Isthmus of Tehuantepec will, it is also reported, be given to the Le Sere Company as soon as the route shall be practicable. This will give employment to a number of steamers to communicate with the Pacific coast through this channel. The line through Nicaragua, which has been stopped by the war in that region, will also probably be soon restored, and a number of steamers will then be again employed on each ocean to keep up this communication.

Fall of a Tunnel.

The Broadtree Tunnel near Bettaville, Va., thirty-seven miles east of Wheeling, and upon the line of the Baltimore and Ohio Railroad, recently fell in for a considerable distance, burying the track beneath tuns of earth. This tunnel (nearly 2,700 feet, or over half a mile in length) is, we think, the one which caused such an immense amount of trouble and expense in its construction, in consequence of the looseness of the earth, which fell in at two points, so as to make large natural shafts or craters, and finally required the whole tunnel to be arched over very thickly with brick. The opinion is quite general with many that the expense of a tunnel depends on the hardness of the earth, but so far is this from the fact, that the very hardest and soundest rock is far preferable to quicksand or treacherous stone. The roof of this tunnel fell in immediately after a train backed out of it.

New Inventions.

Improved Pump.

The pump represented in the accompanying figures is the invention of Birdsall Holly, of Seneca Falls, N. Y. It is remarkable for its cheap and durable construction, and for the ease with which its parts may be made accessible for repairs and adjustment. It is intended to serve as an ordinary lifting or suction pump for domestic, manufacturing, or agricultural purposes.

Figs. 1 is a vertical section of the whole, and Figs. 2 and 3 are different views of the piston or upper box.

The packing of pumps and construction and proper arrangement of the valves, so as to combine durability and tightness with cheapness of construction is a matter of considerable difficulty. The drainage of the water from the whole pump and pipe in winter, to avoid injury from the frost, and the retention of the same in the summer season, to avoid the drying up of the leather and the temporary disabling of the pump in consequence, is another point of almost equal importance, although one less rarely attained in perfection; and the junction of the pump with its pipe is in nearly all the cheap and imperfectly erected pumps, a source of considerable annoyance, from the fracture of the pipe by vibration or the continuous slight bending to which it is subjected, by the working of the pump when in action. The pump cylinder is usually secured by simple wood screws through a narrow flange, and so soon as the wrenching strains due to the working of the handle causes it to work in the slightest degree at each stroke, the disintegration of the metal at the top of the suction pipe commences. This invention pretty effectually overcomes this evil, as also the others before enumerated.

A is the lever or brake, B is the pump rod, and C is the upper box or valved piston. The lower extremity of B is a screw, and bears, at a proper distance above C, the spider or open frame, D, which, being tightly confined thereon, keeps in position the cup leather, or annular piece represented at the edges of the box. This leather is peculiarly held by this device, so that it serves both as a packing for the box and a flap or valve to cover the series of holes, E. The whole box, now fully described, can be very readily removed by taking out the pin at the junction of the pu up rod with the brake.

The pump cylinder is secured upon a casting, F, which is supported upon legs, F', which may be a continuous shell, if desired, the better to defend the well against the entrance of dirt. The part F has also a shell or very deep lip, F", hanging from its under surface as represented, on which is fitted by bolts the flaring top of the suction pipe, G. The weight of G is supported by the casting, H, and the separation of the pipe from the pump is effected with little difficulty, by removing the nuts, I, for which latter purpose it is desirable to make the frame, F, open, so that the wrench may reach through to release G without lifting the pump.

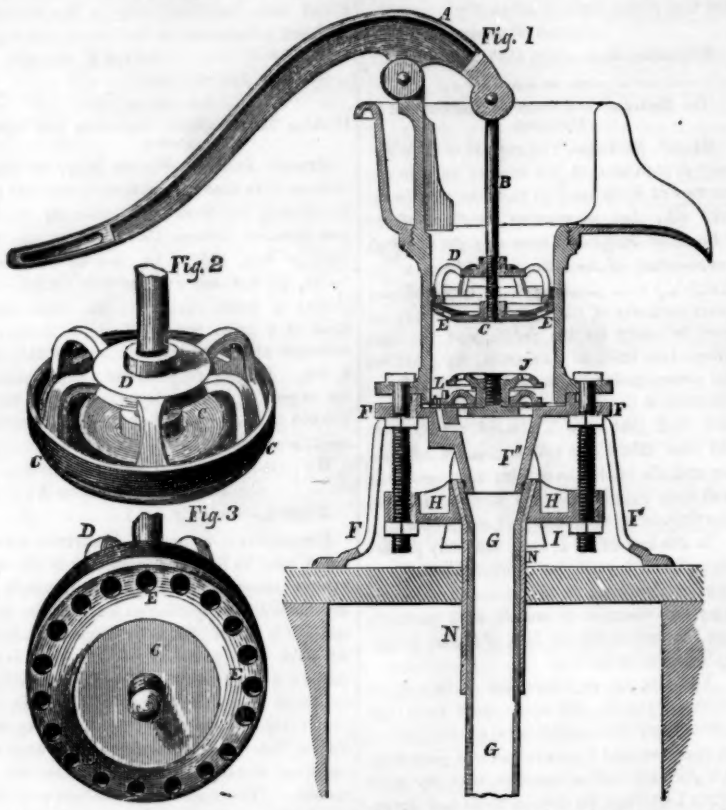
J is a fixed guard secured at a proper distance above the upper surface of F. Beneath this is mounted the casting. K, free to play up and down upon the central stud, and beneath K is laid a simple disk of leather. The shape of K allows it to print itself into, and form a very tight contact with this leather, and the two move up and down together, forming a very tight and strong valve, the casting always protecting the leather from the great pressure of the water, which might otherwise drive it deeply into, or through the holes. The pin, L, fixed in F, stands in holes prepared for its reception in both J and the leather, and thus prevents its rotating—a matter of some importance in respect to the provision for draining, as will soon appear.

M is quite a small orifice made in the casting, F. When this is not covered by the leather it allows the back flow of small quantities of water all the time the pump is working, and allows the gradual escape of all the water after the action ceases. This is the practice adopted with this pump in winter, but on the approach of warm weather the upper box is lifted out, and the leather turned around and adjusted in another position upon the pin, L. The flap of leather is so shaped that it will now extend across and stop the opening, M, so that the water is retained in a manner which, though not, of course, absolutely tight, is as nearly so as in any other pump.

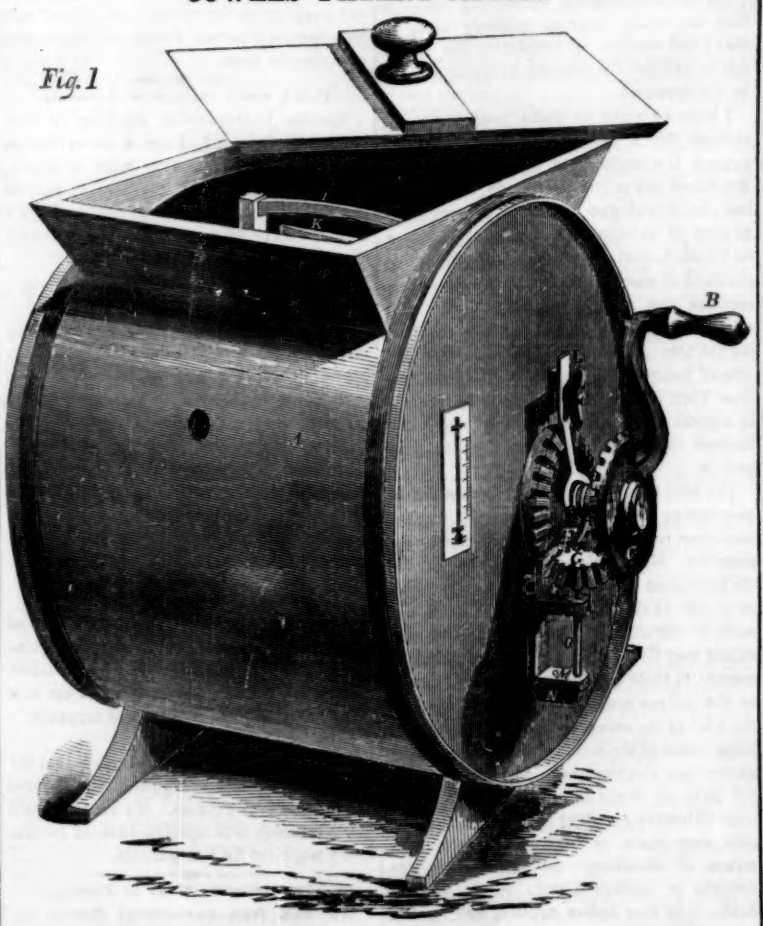
A principal object in connecting the pipe in the manner represented is to allow the encasing of the former in a stout protection, which of itself is sufficient to greatly strengthen it against the working effect. The working is, of course, less than usual, in consequence of the increased breadth of base of the pump, but the main security arises from the protecting case, N, which is previously tightly fitted on the lead pipe.

For further information respecting this invention, inquiries may be addressed to the assignees, Messrs. Silsby, Mynderse & Co., Seneca Falls, N. Y.

HOLLY'S IMPROVED PUMP.



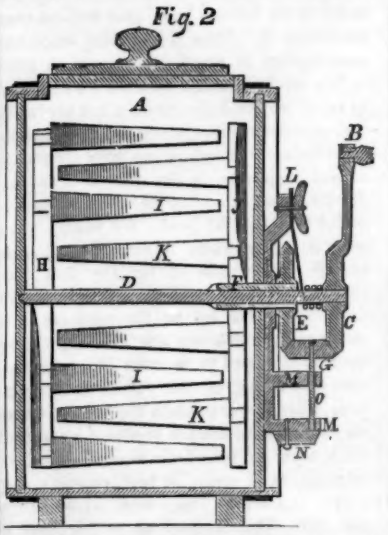
COWLES' PATENT CHURN.



The accompanying engravings represent a species of double rotary churn, invented by E. P. and J. A. Cowles, of Schenectady, N. Y. and secured by Letters Patent, dated March 3, of the present year. It beats the cream or milk in two opposite directions at the same time, and consequently acts with great effect in breaking the globules which contain the fatty portions of the secretion. It is, of course, sufficient for popular illustration to know that the process of churning is simply a violent agitation of the cream in any manner which may be most convenient; but the theory of the process established by microscopic and chemical investigation, consists in the supposition of small tenacious globules or spherical cases containing oleaginous matter within. These globules are of less specific gravity than the watery portions of the milk, and rise to the surface when the whole is allowed to remain at rest for a sufficient length of time, a result which we term the "rising of the cream." The effect of churning is simply to break these enclosures, and allow the fatty particles to cohere together.

Fig. 1 is a perspective view, and Fig. 2 a vertical section in the plane of the axis. A is the body or case, and B the handle or crank of the churn. C is a suitable metallic bevel gear wheel to which B is attached. D is a horizontal shaft, on which C and B are mounted. E is another gear wheel corresponding to C, and mounted on the sleeve, F, which encircles D. G is a small bevel gear wheel mounted on a vertical shaft running in fixed bearings below, and which serves to transmit the motion of C to the corresponding gear wheel E, but changing it to a rotation in the reverse direction. H is a stout crossbar fixed on the shaft, D, within the barrel of the churn. I I, &c., represent slightly curved bars fixed on H, and projecting in lines nearly parallel to the shaft D. J is a crossbar cor-

Fig. 2



responding to H, fixed on the sleeve, F, and consequently having a motion in the opposite direction to that of H. K are bars fixed on J. The action of these two frames, H I and J K, revolving in opposite directions, is very efficient in beating the fluid. It may be driven at almost any velocity desired, as the action of the two frames counteract each other, and serve to agitate the fluid very violently, without giving it any considerable rotary motion.

L is a screw with a guide above. M M are fixed bearings or supports for the vertical shaft G, and N is a step to support G. This step may be turned horizontally on a pivot on one side, so as to allow O to drop down out of gear with the two wheels C and E at pleasure. When thus released, the frame, J K, is set at liberty, and it revolves or not with the motion of G H, according as it is acted on by the fluid, or by the butter, when the operation is nearly completed. In gathering the butter, therefore, this step, N, is always turned to one side, and shaft, O, allowed to drop out of gear.

The effect of the curvature given to the bars I and K is to soften the violence of the concussion which would otherwise occur at the moment of the frames meeting and passing each other. The curvature distributes the shock over a longer period of time, so that there is no sensible concussion, and the strain which might otherwise break the parts is very greatly diminished.

A thermometer is attached, which enables the operator to entirely control the temperature of the cream. It has been found by strict chemical investigation made by the leading chemists of Germany that cream, churned at a temperature of about 65°, makes 20 per cent more butter, of improved quality.

This churn is manufactured by W. & W. Whiting, Baldwinsville, Mass. Rights for the New England States may be had by addressing L. C. Holden, Fitchburg, Mass. For any other section, address J. A. Cowles, Schenectady, N. Y.

Scientific American.

NEW YORK, AUGUST 8, 1857.

The Final Resignation of Judge Mason.

We are sorry to announce that Hon. Chas. Mason has finally resigned the office of Commissioner of Patents. Before this notice reaches our readers, he will have vacated the position upon which he has shed so much lustre for the past four years.

We regard this as a calamity not easily repaired, for it is universally conceded that no other Commissioner since the organization of the Patent Office has performed its delicate and responsible duties with equal acceptance. We have labored industriously to induce Judge Mason to remain, and have upon one or two former occasions, when he anticipated surrendering the office, done much to induce him to yield to the general wish that he should not give up a position for which he is so peculiarly qualified.

Since the establishment of the Department of the Interior, the Patent Office has been one of its subordinate bureaus, and the Commissioner has been subject to the dictation of the Secretary. It is well known to our readers that the SCIENTIFIC AMERICAN has always opposed this dictation. Previous to the appointment of Judge Mason, the head of the Pat nt Office had been a most obsequious tool in the Secretary's hand—a servant prompt to do his master's bidding. Judge Mason was too independent and self-reliant to bow meekly to such interference; and on one occasion it is said that the late Secretary McLelland actually reported him to President Pierce as an insubordinate officer. But to the credit of Mr. Pierce be it said, he considered it too delicate a subject for him to meddle with.

It is reported that the immediate cause of the Commissioner's resignation grows out of the fact that he had given an order for a fine collection of specimens of fruit in wax, under an appropriation of ten thousand dollars made by Congress for the advancement of the interests of agriculture, which order was countermanded by the Secretary of the Interior.

We know nothing of this alleged interference with the Commissioner's duties; but if so, it is only another argument in favor of the independence of the Patent Office from this outside control. It cannot be seriously questioned that, in view of the special objects for which the Office was established, viz., to encourage and advance the industrial interests of the country, an officer should be appointed clothed with full power to manage all of its complex and important duties without unnecessary dictation or interference. Even if it remained a subordinate bureau to the Department of the Interior, we maintain that the Commissioner of Patents should be allowed to administer its affairs independent of any active interference from the heads of other departments.

Well, Judge Mason has left the Patent Office, and it devolves upon the President to appoint a successor. Who will he be? is a question now anxiously put by all who feel interested in the future success of the Office. He will be a politician—that, we fear, is inevitable—but we have confidence in the wisdom of President Buchanan, and we believe he will appoint no one who has not such qualifications as are requisite to the proper management of the Office. Two qualities are indispensable, namely, legal acumen and general liberality of judgment. Important questions of law are almost constantly brought before the Commissioner for adjudication—questions involving great interests, and therefore requiring an amount of legal knowledge commensurate to their proper consideration. A Commissioner without this special qualification will utterly fail in his duties, however learned or scientific he may otherwise be. A mere inventor—a mere mechanic—a mere politician—a mere manufacturer—is not the person wanted. Inventors and mechanics, whose interests we are ever defending, will understand our meaning when we employ the above language. They want an able and liberally disposed Commissioner—one who will not only protect their rights, but sedulously endeavor to foster their interests. Such a man was Judge Mason. We only hope his successor will be equal to him in all respects.

Wetherede' Combined Steam.

We are indebted to Mr. Wethered for a number of pamphlets, and other information, drawings, etc., in relation to the success of their patent system of using mixed superheated and common steam in large engines in Europe. The package was sent from Paris July 10th, and contains quite full details of operations to that date. The system has been experimented with and reported on very favorably both in Great Britain and France, and in Austria the "Danubian Steam Navigation Co.," owning 110 steamers, have been using it on one steamer, the *Neusatz*, since September last, and have now eight steamers fitted to work on this system.

We have explained the nature of the invention on previous occasions—see No. 27, page 210, and No. 30, page 235, this Vol. It consists briefly in leading a portion of the steam through heated pipes, so as to superheat it, and mixing it with the remainder—which latter is conducted off in the ordinary manner—at or near the point where it enters the cylinder. The efforts to make it practically valuable in the early experiments, were defeated by the oxydation and destruction of the heating pipes, which were placed within the furnace; but in these Transatlantic efforts the experience on this side has enabled them to avoid this evil, and the system appears to have been very highly successful. H. B. M. steamer *Dee*, a vessel used as a means of instruction to the boys in the naval schools, and a vessel admirably adapted to careful and accurate experiment, was the first to which it was applied. Her boilers are multi-tubular, or rather, what we should term in this country return tubular, the tubes lying nearly horizontally above the fire, and conveying the products of combustion from the rear or back of the boiler to the front above the furnace. The pipes are placed in a convoluted form in the chimney or up-take, and the waste heat only is used for superheating the portion of steam which passes through them. In all the applications made, the system has, it is stated, proved highly advantageous in every respect, the economy of fuel varying from 30 to 52 per cent.

Mr. W. writes that "pipes for superheating which have been in constant use for fifteen months were lately examined by order of the Admiralty, and found to be perfect in every respect. The fact that sufficient heat can be obtained for superheating from the waste heat without injury to the pipes, is highly important.

"We first offered our new system for application to one of the United States steamers after it had been practically tested by the Engineer-in-Chief of the Navy, and reported on most favorably, but regret to say that the offer was declined; we then submitted it to the Governments of Great Britain and France, both of which, I am pleased to say, appreciated it, and offered us every facility for developing and bringing to a successful issue a system of so much importance to the commercial and manufacturing industry of the world."

Since the experiments in Europe have been found tolerably successful, efforts are again being made to render it available in this country. The agent of the Collins' steamers, who tried the earliest and very prolonged and careful experiments both on a stationary and marine apparatus, has always been hopeful of its success. On her last voyage the steamship *Atlantic*, of that line, went to sea fully provided with all the apparatus for superheating, but so arranged that it could, without difficulty, be dispensed with at pleasure. On trial trips here, the engine—which could only make 13 revolutions per minute with ordinary steam at 20 pounds pressure—made 14 1-2 revolutions with the combined steam, even at only 15 pounds pressure—all other conditions being apparently equal. But although this great result was obtained on the trial trips, the invention was not used, we believe, except during the first few days of the outward passage, nor was it used at all on the return. We have not learned the reason for this, and presume some difficulty has been met with which may be ultimately overcome. It is difficult to see how and why the mixture is more efficient, but the evidence seems to establish the fact, and we hope the obstacles to its use will not prove insurmountable.

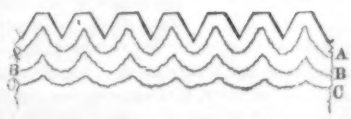
Sharpening Irregular Tools.

When an angle or cutting edge has become rounded off, or dulled, a removal by any means of a coating from the surface, will restore the sharpness of the angle. This principle has been made to some extent available in a number of ways, one of the most obvious of which is the sharpening of old files by heating them to redness in a common forge fire, and plunging them in cold water—in other words, by heating and hardening them over again. There is nothing in the hardening itself which is at all superior to that originally imparted to the file by its manufacturer, indeed it is generally much better hardened by the professed file maker than any smith can subsequently do it; but the files so treated are very generally improved by the operation, on account of their superior sharpness. One effect of the heating of the steel in the open air is to oxydize a thin coating, or in ordinary language, to "raise a scale" on the whole surface, and this increases the sharpness of each tooth of the file. The operation is, of course, of no service unless the teeth have become very dull, and it is inexpedient to employ this means of rejuvenating more than once.

The cut annexed, Fig. 1, explains very clearly how the removing of a uniform coating can increase the sharpness of a dulled edge. Fig. 2 shows the same effect applied to the teeth of a file, and also shows why it is not well to attempt to repeat it several times, owing to the gradual obliteration of

Fig. 1

Fig. 2



the teeth, even if the scale could be made of exactly uniform depth in each instance. The successive lines, A A, B B and C C, show the outline of the surface after one, two and three repetitions of the process. In practice there are two objections to this method of sharpening files, aside from the difficulty of hardening them properly: these are the irregular depth of the oxydation, which gives a very rough and imperfect form to the teeth, and the decay or rotting of the steel. Steel may be worked an indefinite number of times if it is well hammered at each operation; but when, as in this method of sharpening files, the metal is more than once heated and hardened without hammering, its cohesion becomes enfeebled, and after several repetitions of the process it cracks into fragments.

A better way of producing a similar effect on fine articles is to corrode the surface by the application of diluted acid. This is subject to the same evil of irregularity and roughness as the other, but produces no bad effect on the character of the metal. In fact, it has been affirmed to improve the quality of poor or imperfectly hardened steel. Any of the acids which bite steel can be employed, but sulphuric or vitriol is generally preferred, using only about one part acid with from ten to twenty parts water. Knives after being thoroughly cleansed of grease and allowed to lie some half an hour in this bath receive a smooth fine edge with very little whetting; and although the action is rather too slow and feeble to be generally applicable for renovating files, it may be used with very good effect on sickles and the like toothed cutters. The work should be very thoroughly rinsed in pure water after its removal from the acid, and then dried.

Ocean Steam Navigation.

Two-fifths of the gross value (not the bulk or weight) of importations from England and France into the port of New York is by ocean steamers, mostly foreign. Mr. Kennedy, Superintendent of the emigrant depot at Castle Garden, has showed that of 86 080 passengers arriving here during the last six months, 18,460 were brought on steamers, and that of 57 steamers bringing passengers during the last eighteen months, only two were under the United States flag, against 35 under the British. The English are now very rapidly outstripping us in steamers. One of our cotemporaries says that at this moment there are no less than *three hundred* steam propellers, ranging from one thousand to fifteen hundred tuns, building on the Clyde and in the ports of Great Britain. The British steam engine builders were never more busy than at present. Side-wheel steamers are spoken of as likely to be wholly superseded—no vessels of that description being constructed. Meanwhile our shipyards are deserted, and scarcely a single steamship of any size is building in the United States.

Our New Volume.

CALIFORNIAN and FOREIGN SUBSCRIBERS are hereby notified that a new volume (13) of the SCIENTIFIC AMERICAN will commence on the 12th of September, and it is therefore time for those whose subscriptions expire with this volume to remit without delay, in order that they may be sure to get the first numbers of the new volume. Californian subscriptions are received at our regular rates. See Prospectus. The following are the rates per annum required to cover subscription and advance postage to the countries annexed:—

Great Britain,	$3 00	France,	$3 00
Belgium,	$3 50	Prussia,	$3 50
Russia,	$3 50	Germany,	$3 50
Austria,	$3 00	Italy,	$3 00
Spain,	$3 00	S. America,	$6 00
West Indies,	$3 00	Mexico,	$3 00
Sand'h Isl'ds.,	$3 00	Canada,	$2 26

As the circulation of our journal is becoming very extensive in Europe, we deem it important to publish the above list as a guide for those who may desire to subscribe for the new volume.

A Gathering of Savans.

The eleventh annual meeting of the American Association for the Advancement of Science will be held at Montreal, C. E., commencing on Wednesday, August 12, at 10 A. M. The officers of the Association for the Montreal meeting are, Professor J. W. Bailey, President; Alexis Caswell, Vice President; Dr. John Leconte, General Secretary; Prof. Joseph Lovering, Permanent Secretary; Dr. A. L. Elwyn, Treasurer. Local Committee, Sir William E. Logan, F. R. S., President; A. N. Rennie, Esq., Secretary.

Mysterious Disease.

The "National Hotel disease" has suddenly made its appearance in the capital of Russia. After a dinner which took place at a large educational establishment in St. Petersburg for the daughters of the nobility, under the patronage of the Empress, a number of young persons who were present on the occasion were taken suddenly ill. Five of them died within twenty-four hours, and the sixth was in the greatest danger. The Emperor visited the establishment, and ordered a most searching investigation to be instituted, but nothing has yet been discovered to throw light on the subject.

Inventors Looking Up.

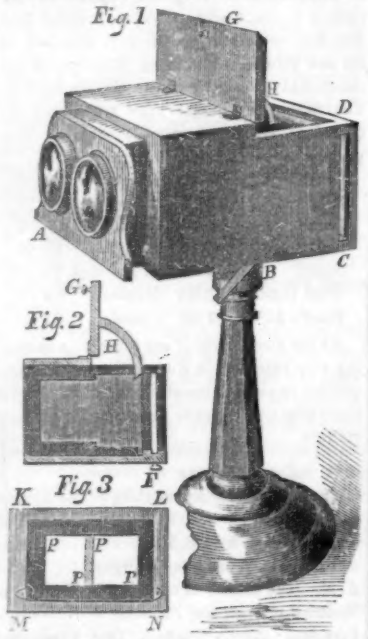
At the recent Commencement of Union College, Schenectady, N. Y., under the presidency of the venerable Dr. Nott, himself a patentee of several improvements, Hiram Berdan, of this city, the well known inventor, received the degree of Master of Arts. This recognition of men of genius by our colleges will tend to elevate in the social scale a most worthy class of our citizens, hitherto quite neglected, so far as the bestowment of honors are concerned.

Twenty-five camels arrived in San Antonio Texas, on the 22d ult., for the use of Lieut. Beale's party in opening the new wagon road to the Pacific.

Scott's Improved Stereoscope.

The stereoscope—an apparatus by which the eyes are enabled to receive the light from pictures in such a manner as to entirely rob them of their flat character, and cause them to apparently project like statuary or bass relief—has only risen to importance since the discovery of the daguerreotype art. The latter, by facilitating the production of fine cheap pictures, has elevated the stereoscope to a place of great importance, but it is yet far from perfect.

Stereoscopes, as hitherto constructed, are of two kinds: first, with two separate entire lenses, placed in the instrument at the same distance apart as the eyes of the observer. In this way the optical axes of the eyes are parallel, the right eye being directed in a straight line to the right hand stereoscopic picture, and the left eye to the left picture, and the rays from these objects being thus also parallel, the combined picture is seen in the same way as very distinct objects are seen, such as the sun, distant hills, &c.; and Second, by the rays of light from the two pictures being refracted by the lenticular arrangements adopted, so that they emerge from the eye-pieces as if they both radiated from a near object, as near as the stereoscopic pictures themselves, that is, about six or seven inches distant. Both these modes are objectionable; the first, because few eyes can



accustom themselves to look at a near object as if it were very distant; and the second, for the reverse reason, as from the unnecessary extent of refraction the combined pictures are shown as exaggerated and distorted miniatures of the real objects.

In the proposed arrangement a medium course is taken. The double eye-piece is so arranged that the rays from the two pictures come to the eye as if they radiated from a point of medium distance, such as that at which we are in the habit of looking at natural objects, the effect being that the eyes of the observer instantly form the combined picture, and the reality of the view is consequently much more strongly impressed on the mind, and the illusion much increased.

Fig. 1 is a perspective view of the complete instrument, Fig. 2 a longitudinal section, and Fig. 3 a view of the near end of the instrument, with the slide removed. It consists of a box, B, the front part of which has ground glass inlaid in it. Immediately behind the ground glass a perpendicular slot, C D, is made in the box, so as to allow the stereoscopic slides to be placed in the field of view. The front half of the top of the box opens as a lid, G, and the inside of the lid being covered with silver or gold foil, serves to reflect light on the pictures in the slot. This lid is retained in any position by a clip of brass, H, fastened to it, and clipping on to the longitudinal diaphragm, I, which stretches along the inside of the box, serving to divide it in two, and prevent the observer from seeing more than one of the two views with either eye at a time. The near end of the box, B, has an opening in it, K L M N, (Fig. 3,) so as to admit the eye-piece A, which slides out so as to suit different eyesights, as represented in Fig. 1. The box, B, is provided with a double diaphragm, which admits I within it so as to form a continuation thereof and is furnished with a transverse vertical diaphragm, fixed at one half of its length and having two square apertures in it, P P, of sufficient size to enable the observer to see the entire pictures through them, and no more. This diaphragm serves to assist in preventing unnecessary light reaching the eye of the observer, and detracting from the clearness of the pictures. The average distance between the centers of the eyes being about 2 3-8 inches, the most advantageous average distance apart of the lenses constituting the eye piece of the stereoscope is from 2 1-4 inches to 2 7-16 inches, and a very convenient size for each lens is 2 1-8 inches diameter, or when set in their frames, 2 inches aperture. At the distance mentioned, the vision of the stereoscopic objects is perfectly distinct for the great majority of individuals, but in exceptional cases adjustment may be applied to the instrument, by which the distance between the centers of the lenses may be varied. The lenses themselves may either be constructed of one material or made compound or achromatic. Plano-convex combinations, with the plane surface next to the eyes of the observer, have been proved to be highly advantageous for this purpose.

This is an English invention, patented in Great Britain, November 3, 1856. It has not been patented in this country.

The Agricultural Machine Exhibition.

We condense from the New York *Daily Times* the following remarks by the reporter for that journal in relation to the National Exhibition at Syracuse:—

On Friday morning, the last test of the dynamometer was applied to the mowers, and all went through without breaking the instrument, so that the committee of judges were able to make complete notes of the motive power which each machine requires to work it. Scientific gentlemen present place much reliance upon the ability of the dynamometer to make accurate measurement of the power exhausted in moving these machines, and I have no doubt of the correctness of the theory upon which they are constructed; but practical men will not be long in discovering objections which justify them in doubting the accuracy of their measurement—especially when applied to any machinery propelled by horses—the drivers of which are seated on the machine. Some horses pull much harder on the bit than others. It is no uncommon thing on city avenues to see a fast horse taking the bit in his mouth and moving a light wagon with two persons, inside of four minutes, without any strain upon the traces. How easy it would be, then, for a good driver, with a team working well up to the bit, to relieve the drag upon the traces to which the dynamometer is attached, of from 50 to 100 pounds. As near as I could ascertain, the general average of the machines, as marked, required a power equal to 400 pounds—the range being from 325 to 450 and 500. Supposing a driver to take from the traces a draft of only 50 pounds, on a machine that required but 325 pounds to move it, and the deception amounts to 15 per cent.

I think it was at a late trial of mowers in Ohio, the dynamometer showed that Allen's machine only required a power of 275 pounds. Now, though Allen's machine is not by many pounds the heaviest of those in the field, yet any man can see that it cannot be moved through any grass by any such power; and I should feel perfectly safe in saying that a weight of 275 pounds would not move it on smooth ground with the knives at rest.

The greatest trial to which the machines were subjected, was to cut one and one-quarter acres of grass. It was entirely insufficient to test these only to the extent of less than an hour's work. A field of five acres allotted to each would have made the trial far more satisfactory. I think there were a half dozen machines that went through their acre creditably that could not have immediately repeated the dose, without becoming clogged, and in need of more care and tinkering than some of the other machines would have required in cutting ten acres.

The trial of the reapers was the great feature of the exhibition. All the reapers cut well; in that particular there was little to choose between them, but in delivering the grain the work was less satisfactory. The most of them scattered and dragged it too much. In very ripe grain this would prove a fatal objection to most of them. Decidedly the best were McCormick's, Wood's Manny, and Seymour and Morgan's self-raker. Adjoining the field selected by the judges for their test was a piece of grain, which it was proposed to have cut by the machines, so as to increase the amount of work which each should be required to do. But the judges, after examination, declared the ground to be too uneven and hilly. In fact, it was said that no reaper could go over it in safety.

After the official trials were over, and the machines dismissed from the observation and requirements of the Society, General Webb, on behalf of the McCormick reaper, challenged the field to test their metal on the ground which had been condemned by the judges. This challenge was accepted only by Wood's Manny. The two machines entered the field and went to work, soon showing that they, at least, could go wherever a team could travel, and do good work as they went. So regular was the working of these two machines that it was difficult to tell the bundles of one from those of the other—Gen. Webb, at whose instigation the test had been made, being himself at a loss to determine to which he should give the preference.

Such is a true and legitimate test. It was no sunshade parade, but the rough reality. A machine that could encounter such a contest and come out successful may be relied upon at all times and in all emergencies. After to-day's experience of their capacity and power it, would be safe, with either Wood's Manny, or McCormick's reapers, to challenge the world for a real "up hill and down dale" contest.

But nothing like a national exhibition ever can be satisfactory, either to the public or the inventor. It subjects the latter to unnecessary and unnatural competition, and results in loss and dissatisfaction to the other. The machinery is never submitted to practical tests, and, in nine cases out of ten, is tried in localities to which it is totally unfitted.—When the premiums are awarded they necessarily lead the public to give preference to the successful, without any knowledge of its peculiarities, and without any information which can qualify them to judge of its fitness for the work they desire it to perform.

I hope that this is to be the last exhibition of a national character that will ever call upon inventors to compete for premiums for superiority in such a class of agricultural implements, and that hereafter all such exhibitions will be confined to country societies.

Utilization of Night Soil.

Much of the solid material washed down by rivers is of little value in a commercial sense, and except for the objectionable shallows produced by the settlement of the heavier particles in the immediate vicinity of the mouths of the streams so as to obstruct navigation, it would be of no practical importance. The muddy Mississippi which discharges about 13,000,000,000,000 cubic feet of water per annum, has been proved by Professor Riddell to contain 1-3000 solid matter, which would amount to 7,000,000,000 cubic feet; sufficient to cover a square mile to the depth of 250 feet. The Ganges is believed to be equally or more muddy, and there are many other rivers which are conspicuous for the quantities of earthy matter they carry into the sea, but it is only to the portion of fertilizing material thus conveyed that we wish to invite especial attention. The Thames, below London, is odorous with the sewerage matter it bears from that metropolis, and there is scarce a stream flowing through a civilized community but is degraded to the occupation of a haut-boy by the adoption along the banks of itself and tributaries of more or less ingenious devices for dissolving and washing away rather than boarding up and rendering useful the nitrogenized material which, properly applied, would enable the earth to yield the most bountiful harvests.

The *Rural New Yorker*, in an excellent article on this subject in a recent number, calls attention to the fact that the manure from the fowl is more valuable than that from the ox, because the fowl feeds on more highly concentrated food, being principally grain and flesh. The food of man, whether from the animal or vegetable kingdom, is generally highly concentrated, containing more nitrogenized matter and inorganic salts than the food upon which most of our domestic animals subsist. Of their comparative value, many estimates have been made, and several analyses published; none, however, place it lower than double that of the horse or pig.

It is estimated that nine-tenths of this valuable fertilizer is lost to the world, while millions of dollars are annually spent for guano to make up for this waste. The disagreeable odor of night soil is the principal reason for the very general neglect of its importance. Its efficient use is now confined almost entirely to those countries where the need of fertilizers is more seriously felt and their value better appreciated than here. To get rid of the odor, so as to make its use tolerable, is the great desideratum.

One of the best methods of deodorizing nightsoil, without destroying its fertilizing properties, is to mix powdered charcoal with it We have never learned the proportions required to render its use as endurable as ordinary stable manure, and cannot speak with any confidence of the economy of this method of preparing it. Peat is, however, a quite powerful deodorizer, as well as a good manure for most soils, and the treatment of nightsoil where this swampy product is accessible must be cheap and easy. The same firm whose letter on peat fuel appears on another page, add that they know by experience it is a powerful deodorizer, and think it one that every farmer possessing it should use, if only to purify the air of his stables and outhouses.

Night carts may be emptied into an area of suitable size enclosed by small banks of earth to the depth of about one foot, and the whole covered with peat to the thickness of several inches. After remaining till quite thoroughly dry, it may be turned over with a spade, and mixed with more peat, when it is ready to be spread on or plowed into the land. A process substantially similar to this is much practiced in Great Britain. The English, however, use common earth instead of peat, commencing the preparation of a heap in the early part of summer, and either applying the manure to the land, or getting it under cover in the Fall.

We have on several former occasions adverted to the practice of preparing liquid manures, and applying it from a sprinkling cart. In Flanders, where night-soil is more systematically preserved than in any other country, it is generally used in a liquid form. In China, on the contrary, where the greatest number of human beings that can be sustained on a given area is very nearly reached—where the compounding and manufacturing tastes of the people are carried out to such an extent that even tea is made up into bricks, and very extensively used as money in the trade with the Siberians—in that country night soil is mixed with clay and formed into cakes, which, when dried, are sold under the name of "taffo." This manure, we have learned, is much esteemed by the Chinese, and is quite an article of commerce.

Lime is sometimes used to remove the odor from night-soil, but it lessens the value of the manure, as it expels the ammonia. Sulphate of iron is an excellent deodorizer, as it fixes the volatile ammonia; and being cheap and readily obtained, is peculiarly valuable for this purpose. The almost inodorous material poudrette is variously prepared and of various degrees of value, but this sulphate is very extensively employed in the manufacture of some of the best samples. The great opportunities for fraud in the preparation of poudrette must always operate against its use; but the general introduction of any cheap and simple process which will make the material valuable to the agriculturist with the application of but little skill, and avoid the present waste into streams, would produce results of no ordinary importance.

J. B. B., of Fla.—The rust on the interior of your iron pipes may look very formidable, but it cannot in any manner injure the health of persons using the water. Oxyds of iron are innoxious—in fact, nearly all the virtues pertaining to mineral springs are due to iron in the water. Lead oxyds are poisonous, and if, as we somewhat doubt, it is common for water to become impregnated with lead from pipes, lead is highly objectionable.

W. C., of Ill.—Exhaust steam from an engine may be used to advantage in steaming timber, whether the object be to render the same temporarily flexible, or to more rapidly season and kiln dry it. No peculiar apparatus is required further than to allow a tolerably free escape for the steam from the opposite end of the box or chamber from which it is received.

C. S. G., of S. C.—Car seats have been made adjustable in the manner you propose for carriages.

C. S., of N. Y.—There is nothing new in the application of a governor to control a single valve to vary the cut-off. We have seen a common slide valve operated in that way by more than one contrivance. There is not in our opinion anything patentable in that feature of your invention.

D. B., of N. C.—Your almanac is undoubtedly correct, and the rule given in Haswell must consequently be considered only approximately accurate.

L. V. B., of Ky.—We know no means of making elastic tubing perfectly gas tight. We use such a tube in our office to supply a movable burner, but it leaks sufficient to produce a strong smell of gas at times.

G. P., of Va.—You will oblige us by giving diagrams of your wheel and boats.

S. M. & Co., of O.—Address Nicholas Vivian, Consulting Engineer, Pittsburg, stating particulars.

R. L. S., of N. Y.—Yes. The summits of the highest mountains even in the torrid zone are always covered with ice and snow.

W. B., of Mass., wishes to know what is used for staining pine in imitation of black walnut? We have never heard of any such staining.

J. W. N., of Ind.—The printing of pictures or maps on handkerchiefs is a very old idea. We can remember when our heart was made glad, twenty-five years ago, by a present of a cotton handkerchief costing 25 cents, with the verses "Mary had a little Lamb," printed thereon in blue colors around the engraving, characteristic of the subject of the verses.

H. W., of Pa.—There is nothing new in the device you propose for a decanter stopper. It is old and well known. The inquiry in regard to the blind slat we cannot answer without a preliminary examination.

J. R. V. O., of Cal.—Your plan of operating paddles of steamboat wheels, so as to cause them to dip into, and leave the water edgewise by means of a series of cogged gearing, would not save the waste of power against which you complain. The friction attendant upon this great amount of gearing would more than counterbalance the proposed advantages. We cannot encourage you to apply for a patent on it.

T. B., of Ky.—We understand you to inquire whether a person who owned a right, under the original grant, can re-construct a machine to take the place of one which was burned after the patent had been extended? We should say he could not. He could repair the old machine until it was worn out; but if he had the misfortune to lose it by fire, we do not think, under the former decision of the United States Courts that a new machine could be built.

A. R., of Ill.—There has been some delay in the examination of cases in the agricultural department of the Patent Office in consequence of the absence of Chief Examiner Lawrence. His return will undoubtedly cause a prompt disposal of your case, and we hope you will soon receive your Letters Patent.

E. M. K., of O.—The device you propose as a substitute for the crank is the oldest contrivance known to us for the purpose, and has been re-invented times almost without number. It is wholly useless for all practical purposes, and can no more compete with the simple crank in efficiency than the feeblest star can outshine the sun.

W. S., of N. Y.—The area of a circle is the amount of surface in square inches, feet, or the like, which it covers; the square of the diameter is the area of a square which would just enclose the said circle, and the cube is the solid contents of a box which would contain a sphere of that diameter. Study any of the common books on mathematics. The Patent Office Report for 1856 will probably be out in September.

L. H. M., of Ind.—What have you invented? Give us some point to aim an answer at.

W. S. G., of O.—We have never known of a wheel precisely like yours; still there is no particular feature of novelty about it. Weighted buckets suspended as you describe are old, and so are the corrugated and V shaped buckets, but we have never seen the two features combined. It may be a matter of some difficulty to obtain a patent for you; but if it can be shown that any special advantage results from the combination of these particular features independent of the merits of the two features separately considered, you are in our opinion entitled to a patent. If there is any chance at all for a patent, we can get it for you.

D. W. H., of Ind.—We have read your lengthy communication in which you describe plans for navigating canals by steam, and for parallel railways with stationary steam power. It is our opinion that neither of these proposed schemes will ever be adopted, for we consider them impracticable, and should advise you to confine your researches to simple details. A complete revolution in the present modes of canal and railway construction and operation cannot meet with favor, as you will see upon more mature reflection.

Money received at the Scientific American Office on account of Patent Office business for the week ending Saturday, Aug. 1, 1857:—

B. F. S., of Vt., $30; N. A. F., of R. I., $55; J. L., of Wis., $25; R. P., of Mich., $25; D. F., of N. Y., $30; C. H. E., of Wis., $25; J. C., of N. Y., $15; J. L. H., of N. H., $10; J. F. & E. W., of N. Y., $25; F. B. H., of N. Y., $25; J. E., of Ohio, $30; L. S., of Miss., $30; E. M., of Conn., $30; N. N., of Ill., $25; B. & R., of N. Y., $25; A. H., of Conn., $35; J. M. C., of N. Y., $30; R. C., of ——, $15; J. G., of N. H., $15; C. M. S., of Ind., $30; L. F. H., of N. J., $30; W. F., of N. Y., $55; G. G., of Ill., $30; S. P. M., of Ohio, $30; N. H., of Conn., $30; B. B., of Conn., $15; P. S., of N. Y., $40; N. G. A., of Ill., $30; S. G., Jr., of N. Y., $250; C. P. C., of Brazil, $30; S. J. B., of N. Y., $250.

Specifications and drawings belonging to parties with the following initials have been forwarded to the Patent Office during the week ending Saturday, Aug. 1, 1857:—

J. E., of Ohio; M. B., Jr., of Mass.; D. T., of N. Y.; S. L. H., of N. H.; C. H. E., of Wis.; R. P., of Mich.; J. L., of Wis.; N. H., of Conn.; P. S., of N. Y.; C. M. L., of N. H.; J. C., of N. Y., N. N., of Ill.; B. & R. of N. Y.; S. L., of N. Y.; C. P. C., of Brazil; E. A., of Mass.; R. E., of Me.; C. C., of Va.; C. A. R., of Miss.

Back Numbers of the Present Volume—Almost every mail brings letters of inquiry from our patrons for certain numbers of the Scientific American, which we are unable to supply. To save subscribers the trouble of writing for such numbers as we have not got, we append a list of the numbers which are entirely exhausted in Vol. 12:—1, 2, 3, 4, 6, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 21, 22, 23, 24, 27, 30, 31, 35, 36, 39. Those numbers that are not specified above we can supply, and shall be happy to do so to those who have missed them.

Important Items.

Infallible Rule—It is an established rule of this office to stop sending the paper when the time for which it was prepaid has expired, and the publishers will not deviate from that standing rule in any instance.

Patent Laws and Guide to Inventors.—This pamphlet contains not only the laws but all information touching the rules and regulations of the Patent Office. Price 12 1-2 cents per copy. A Circular, giving instructions to inventors in regard to the size and proper construction of their models with other useful information to an applicant for a patent, is furnished gratis.

Inventors Sending Models to our address should always enclose the express receipt, showing that the transit expenses have been prepaid. By observing this rule we are able, in a great majority of cases, to prevent the collection of double charges. Express companies, either through carelessness or design, often neglect to mark their paid packages, and thus, without the receipt to confront them, they mulct their customers at each end of the route. Look out for them.

Give Intelligible Directions—We often receive letters with money enclosed, requesting the paper sent for the amount of the enclosure but no name of State given, and often with the name of the post office also omitted. Persons should be careful to write their names plainly when they address publishers, and to name the post office at which they wish to receive their paper, and the State in which the post office is located.

Subscribers to the Scientific American who fail to get their papers regularly will oblige the publishers by stating their complaints in writing. Those who may have missed certain numbers can usually have them supplied by addressing a note to the office of publication.

Foreign Subscribers—Our Canada and Nova Scotia patrons are solicited to compete with our citizens for the valuable prizes offered on the next volume. [It is important that all who reside out of the States should remember to send 25 cents additional to the published rates for each yearly subscriber—that amount we are obliged to pre-pay on postage.]

Patent Claims—Persons desiring the claim of any invention which has been patented within fourteen years can obtain a copy by addressing a letter to this office stating the name of the patentee, and date of patent when known, and enclosing $1 as fee for copying.

Terms of Advertising.

Twenty-five cents a line each insertion. We respectfully request that our patrons will make their advertisements as short as possible. Engravings cannot be admitted into the advertising columns.

☞ All advertisements must be paid for before inserting.

American and Foreign Patent Solicitors.—Messrs. MUNN & CO., Proprietors of the Scientific American, continue to procure patents for inventors in the United States and all foreign countries on the most liberal terms. Their experience is of twelve years' standing, and their facilities are unequalled by any other agency in the world. Consultation may be had with the firm between nine and four o'clock daily, at their principal office, 128 Fulton st., New York. Our branch offices are corner of F and Seventh sts., Washington, D. C., Nos. 66 Chancery Lane, London, 29 Boulevard Saint Martin, Paris, and 3 Rue Therrsienne, Brussels. Circulars of information concerning the proper course to be pursued in obtaining patents through our Agency, the requirements of the Patent Office, etc., may be had gratis upon application to the principal or either of the branch offices. Communications and remittances should be addressed to MUNN & CO.,
No. 128 Fulton st., New York.

Twenty-ninth Annual Fair of the American Institute at the Crystal Palace in the city of New York. The Managers announce that the Palace will be opened for the reception of goods from Monday, the 7th, until Tuesday, the 15th of September, 1857.—Heavy goods and articles from a distance will be received and stored in the Palace on and after the 1st of July. No article entered after the 15th of September can compete for the premiums. Gold, silver and bronze medals, silver cups and diplomas, will be awarded on the report of competent and impartial judges. Ample steam power will be provided to put in operation machinery of every description. Circulars containing full particulars can be had by applying at the office of the Institute, No. 351 Broadway. Communications in relation to the 29th Annual Fair, addressing WM. B. LEONARD, Corresponding Secretary, will meet with immediate attention.
CHAS. A. WHITNEY, Chairman.
JOHN W. CHAMBERS, Secretary. 48 2

Water Wheels—Vandewater's Patent.—Patented July 17, 1855. The following letter was received by a gentleman who had written to parties using my wheel, for information in regard to its merits, etc.
Louden, Pa., March 10, 1857.
John Heitzler, Esq.—Dear Sir: Yours of 4th inst. is now before us. We can but answer your inquiries by sending you Vandewater's card, and can say to you that his wheel will do all he promises therein. We are using three under six foot head, taking 125 inches of water, giving entire satisfaction. We have three more under eleven foot head, which are doing their work well, and would not exchange them for the Wertz, or any other wheel now in use. With these hasty remarks we remain
Yours, most truly, H. EASTON.
(Signed) JOHN ZIMMERMAN, Miller.
To Mr. John Heitzler, Springfield, Ohio.
State and county rights for the above mentioned wheels for sale by the patentee. Also wheels of any size put up at the shortest notice, and warranted to give good satisfaction. Address, HENRY VANDEWATER, Albany, N. Y. 1*

Incrustation in Steam Boilers—A late patent for removing and preventing incrustation in steam boilers. It has been thoroughly tested, and in every instance has given full satisfaction, by removing all old scale, and preventing the formation of new, keeping the boilers entirely free from incrustation without injury to the iron. Satisfactory proof of its good effects will be given to any wishing to purchase. For sale in individual or State rights. Address Messrs SPENCER, BOARDMAN & SPENCER, Lancaster, Pa., sole agents for the United States. 48 4*

Pearson Crosby's Patent Re-sawing Machines.—The Crosby patent for re-sawing lumber, having been re-issued April 28, 1857, and having purchased the right to the same for the State of New York and Northern Pennsylvania, the subscriber is prepared to sell rights to use the machines in the greater portion of the above named territory, and also to furnish the public with these machines. Having re-built my machine manufactory—which was destroyed by fire on the 9th of Feb. last—I continue to manufacture and have on hand for sale, Woodworth's Patent Planing Machines, from $150 to $1,500, and of a quality unequalled by any other manufacturer. Also the separate parts of the machine, namely, planing knives, side tools, bide cutter heads, cylinders, &c., as well as the above named Crosby Re-sawing Machines.
JOHN GIBSON,
48 13* Planing Mills, Albany, N. Y.

Ohio Mechanics' Institute, Cincinnati.—Fifteenth exhibition of Arts and Manufactures. We desire to call the attention of Manufacturers, Mechanics, Artists, Inventors and others to the above Exhibition, which will be opened in Cincinnati on Thursday, Sept. 10th, and continue daily until the 30th, in a commodious fireproof building, which has been erected for the purpose. It is desirable that those intending to exhibit articles should give early notice to J. B. HEICH, the Clerk of the Institute, who will promptly give any information that may be desired. By order of the Committee. C. F. WILSTACH, Chairman of the Committee.
48 2

Wanted—A second-hand Locomotive Steam Boiler, of about thirty horse power, capable of working at 75 lbs. pressure. Address, stating dimensions and price, D. POWERS & SONS, Lansingburgh, N. Y.
48 3*

Peck's Patent Drop Press—The best machine in use for stamping jewelry, ornaments, tin ware, sweedging iron, &c. A supply of all sizes on hand and made to order by the patentee, MILO PECK, New Haven, Conn. State rights for sale. 48 8*

Iron and Brass Founders—Three patentable inventions for sale. One a mold from which a number of clean metal castings can be taken. Address THOMAS HODGSON, Beach Place, Brooklyn, N. Y.
48 3*

Second-hand Steam Engine and Boiler for sale.—One 8-horse Upright Steam Engine, Boiler 30 inches diameter, 25 feet long, nearly new, and in good running order. For particulars address H. B. MATHER, West Norwalk, Fairfield co., Conn. 48 3*

Something Useful for Machinists and operative of machinery—Simmons' Decimal Chart for finding the size of wheels and pulleys for any required number of revolutions per minute—a great saving of time and lengthy calculations—sent free for $1. D. G. SIMMONS, 253 West 27th st., New York. 1*

The Secret of preserving the teeth and keeping them white as ivory, without the use of a brush, will be sent to ladies and gentlemen sending me one dollar by mail, on receipt of which I will return you a recipe for a cheap dissolving powder consisting of one article, which can be obtained at any apothecary's, and by its application to your teeth you can at any time cleanse them, without a brush or water. When once known, if you value your teeth as a blessing, you would not part with the information for any consideration. Address S. BALDWIN, Box 123, Laconia P O., N. H. 1*

$3000 any person having this amount can purchase the right for the United States of one of the best inventions of the age. A. C. FUNSTON, Frankford road and Master, Philadelphia.
47 2*

Fishermen—If you wish to catch any kind of fish as fast as you can pull them out, get Gardner's Secret Art for Catching Fish, sent for $1. N. R. GARDNER, Peace Dale, R. I. 47 4*

New Invention—Simple and patentable Reaping Machine for sale. For particulars address W. R. MITCHELL, Oneco, Ill. 47 2*

For four letter stamps I will send (free of postage) a copy of the celebrated 100 Metropolitan Hotel recipes for Cooking, Baking, Making Pastry, Preserves, &c. As these recipes are copyright, they cannot be had except of J. R. STAFFORD, 16 State st., New York. 45 4

Woodworth Planing Machines of superior style and workmanship, of various sizes, and the latest improvements. Also Steam Engines and Boilers, Sash and Blind Machinery, Lathes, Planers, Drills, Belting, and all kinds of Machinists' Tools on hand, and for sale at the Machine Depot, 163 Greenwich st., New York. A. L. ACKERMAN. 45 8

Crystal Palace—This splendid edifice is now under the auspices of the American Institute. Samples of the productions of our country in Agriculture, Manufactures, and the Arts, will be received for public inspection. All information relative thereto will be given at the Palace by address ng WM. B. LEONARD, Corresponding Secretary and Agent. 45tf

A wallet safe against pickpockets or loss sent free for $1. DICKINSON & BATE, Hudson, Mich.
47 4*

Steam Engines for Sale—One of 8, one of 12, and one of 18 horse-power. H. A. CRANE, cor. 29th st. and 11th ave. 44 6*

E. G. Cushing's Unequalled Straw and Stalk Cutter.—For finished work, or the right of territory, address the inventor, Dryden, Tompkins county, N. Y. 44 10*

L. D. Goodwin's celebrated Patent Central Vent Water Wheel. For wheels or the right of territory address J. W. DWIGHT, Dryden, N. Y., or E. C. BRAMHALL, 190 Fulton, N. Y. 44 10*

Wanted—300 Active Young Men, at a salary of $100 per month. A capital of only $5 required. Full particulars given to all who inclose a stamp and address N. R. GARDNER, Peace Dale, R. I. 44 5*

Cast Steel Wire Drawing at the Union Works, Paterson, N. J. Orders solicited and carefully filled by CHAMBERLIN & CO. 43 13*

Machinery—S. C. HILLS, No. 12 Platt street, N. Y., dealer in Steam Engines, Boilers, Planers, Lathes Chucks, Drills, Pumps; Mortising, Tenoning, and Sash Machines, Woodworth's and Daniel's Planers; Dick's Punches, Presses, and Shears; Cob and Corn Mills; Harrison's Grist Mills; Johnson's Shingle Mills; Belting, Oil, &c. 27 63w

Ingersoll's Improved Hay Press—The best portable Hand Power Press in use for the purposes of Baleing Hay, Straw, Broom Corn, Husks, Hair, Hides, Moss, Hemp, Rags, Wool, Cotton, &c. Prices from $50 to $200. Also an improved press for ornamental composition work. Price $20 and $65. Also Ingersoll's Patent Tree Saw, for sawing down trees. This is a perfectly portable machine, and has been thoroughly tested during the past winter. Price $75. All orders filled promptly. Also State and County rights for sale. Circulars containing full information sent on application to the FARMER'S & MECHANIC'S MANUFACTURING CO., Green Point, Kings co., L. I. 44 4*oow

Woodworth's Patent Planing Machines of every kind and all prices. A large assortment on hand, and I am prepared to construct any machine to order from ten days to two weeks, and guarantee each machine to be perfect in its construction, and give purchasers entire satisfaction. The patent has expired, and will not be renewed. I make this business exclusive, manufacturing nothing but the Woodworth Machines, and for that reason can make a better article for less money; and with my fifteen years' experience I fully guarantee each machine to come up to what I am willing to recommend, that is, that each machine shall be more than equal to any other manufactured for the same price. JOHN H. LESTER, 57 Pearl st., Brooklyn, N. Y., three blocks above Fulton Ferry. 35 tf

Steam Pumps, Boiler Feed Pumps, Stop Valves, Oil Cups, Cocks, Steam and Water Gauges, sold by JAMES O. MORSE & CO., No. 79 John street, New York. 41 13

Boiler Flues—All sizes, and any length desired, promptly furnished, by JAMES O. MORSE & CO., No. 79 John street, New York. 41 13

Wrought Iron Pipe—Plain and galvanized sold at wholesale, by JAMES O. MORSE & CO., No. 79 John street, New York. 41 13

Engraving on Wood and Mechanical Drawing, by RICHARD TEN BYCK, Jr., 128 Fulton street, N. Y., Engraver to the Scientific American. 16tf

To Inventors and Manufacturers—Rooms with power, for the exhibition of machinery, can be had in the Depot Buildings, corner of Elm and Franklin sts. The location is extremely desirable for its prominence and convenience to the business part of the city. Apply to T. BENNETT, on the premises. 43 tf

Machine Belting, Steam Packing, Engine Hose.—The superiority of these articles manufactured of vulcanized rubber is established. Every belt will be warranted superior to leather, at one-third less price. The Steam Packing is made in every variety, and warranted to stand 300 degs. of heat. The hose never needs oiling, and is warranted to stand any required pressure; together with all varieties of rubber adapted to mechanical purposes. Directions, prices, &c., can be obtained by mail or otherwise, at our warehouse, NEW YORK BELTING AND PACKING COMPANY John H. Chesever, Treasurer. No. 6 Dey street, N. Y. 40 tf

Wait's Patent Spoke Machine does double the amount of work with the same amount of power, and equally as good as any machine in use. Machines and rights for sale very low. Address F. H. WAIT, Barkerville, Saratoga co., N. Y. 45 4*

Forbes & Bond, Artists, 89 Nassau st, N. Y., Mechanical and general Draughtsmen on wood, stone, &c.

Steam Engines, Steam Boilers, Steam Pumps, Saw and Grist Mills, Mortising Mills, Rice Mills, Quartz Mills for gold quartz, Sugar Mills, Water Wheels, Shafting and pulleys. The largest assortment of the above in the country, kept constantly on hand by WM. BURDON, 102 Front st., Brooklyn, N. Y. 46 tf

Lap-welded Iron Boiler Tubes.—Prosser's Patent.—Every article necessary to drill the tube-plates, and set the tubes in the best manner.
44 26 THOS. PROSSER & SON, 28 Platt st., N. Y.

Woodworth Planers, Steam Engines, &c.—Twenty-seven years' experience enables me to furnish Woodworth Planers for surfacing one or both sides, planing and matching, rabbiting, beading, or for moldings or clapboards, in any variety of beautiful construction and great power. Ample evidence of the superiority of my machines will be furnished from parties that have other machines in the same mill. Every machine will be accompanied, if desired, with a written warrantee. As some parties have been supplied with machines of another make when they supposed they were getting mine, I would advise that purchasers should buy none unless my name is on in full. Matteawan steam engines, machinists' tools, cotton and woolen sash-blind and door machinery, leather banding, &c., furnished at the manufactory at Matteawan, N. Y., or at 62 Courtland street, N. Y. S. B. SCHENCK, Agent. 39 tf

The best planing machine in the World—Patented Nov. 21, 1854 and Nov. 13, 1855. These patents were obtained for improvements upon the celebrated Woodworth Planing Machine. They received a Gold Medal at the last exhibition of the Massachusetts Charitable Mechanics' Association. Machines of all kinds and sizes constantly on hand, which are warranted to give entire satisfaction, and to be superior to any now in use. For further information address the patentee, JAMES A. WOODBURY, No. 1 Scollay's Building, Court st., Boston, Mass. 42 13*

Oil! Oil! Oil!—For railroads, steamers, and for machinery and burning. Patent improved Machinery and Burning Oil—will save fifty per cent., and will not gum. This oil possesses qualities vitally essential for lubricating and burning, and found in no other oil. It is offered to the public upon the most reliable, thorough, and practical test. Our most skillful engineers and machinists pronounce it superior and cheaper than any other, and the only oil that is in all cases reliable and will not gum. The Scientific American, after several tests, pronounced it "superior to any other they have ever used for machinery." For sale only by the inventor and manufacturer.
F. S. PEASE, 61 Main st., Buffalo, N. Y.
N. B.—Reliable orders filled for any part of the United States and Europe. 40 tf

New Haven Mfg. Co.—Machinists' Tools, Iron Planers, Engine and Hand Lathes, Drills, Bolt Cutters, Gear Cutters Chucks &c., on hand and finishing. These Tools are of superior quality, and are for sale low for cash or approved paper. For cuts giving full description and prices, address, "New Haven Manufacturing Co., New Haven, Conn. 40 tf

Harrison's 30 inch Grain Mills—Latest Patent.—A supply constantly on hand. Price $200. Address New Haven Manufacturing Co., New Haven, Conn. 40 tf

The Ten Southern States—The right to manufacture and sell a valuable article, (patent issued June 30, 1857,) in the above-named States, is now offered for sale at 393 Broadway, corner Walker street, New York. R. S. JENNINGS, Patentee. 45 4*

For two letter stamps I will send (free of postage) six Anatomical Engravings, with remarks. Address J. R. STAFFORD, Practical Chemist, 16 State st., New York. 45 4

To patentees and purchasers—The subscriber will examine or experiment on the working of new machines and processes, prepare elaborate reports, and give professional opinions for public or private use. Refers to Munn & Co. THOS. D. STETSON, Consulting Engineer, 5 Tryon Row, New York. 45 tf

Screw Bolts with Square, Carriage or Countersunk heads, bolt ends, square head wood screws, set screws, machine screws, ratchet & breast drills, standard steel and shrinkage rules for sale, by CHAS. MERRILL & SONS, 556 Grand st., New York. 46 5*

Mechanics and Manufacturers—Tennessee Exhibition. The Third Annual Fair of the Mechanics' Institute of Tennessee will be held at Nashville in October next. Exhibitors from all the States will be permitted to enter articles and compete for the first premiums. For particulars address WM. STOCKELL, President, or H. K. WALKER, Secretary. 45 6

Science and Art.

Compressed Air Bath.

MESSRS. EDITORS—The compressed air bath has been successfully employed in France for seventeen or eighteen years, and it is from records thence obtained, that our first impressions regarding its employment were received. It has also been introduced into England. Were it not that an expensive apparatus is necessary, involving much time and expense in its successful management, no doubt it would have long ago taken its place and superceded most of the other means employed for the diseases for which it is peculiarly applicable. We have successfully overcome all the difficulties of delay and extra expense incident to a new enterprise, and the whole operation and its effects may be witnessed daily at our institution by all who choose to inquire.

A little reflection will render the rationale easily comprehended by every one, and will lead to a simpler view of the pathology of diseases of the respiratory organs than is held by the schools of medicine or the multitude of consumption curers of the present day.

Suppose that in consequence of congestion or inflammation of respiratory passages, or disease of substance of the lungs, the air is excluded, so that a portion, say one-third, of the efficiency of the organ is suspended. A hurried respiration and rapid pulse always attends this condition, and is an effort at *compensation*—the best the system can do under the circumstances. Can the inhalation of any drug vapor, mixed with air, compensate for the deficiency of *air?* Is it medicine that is now demanded?

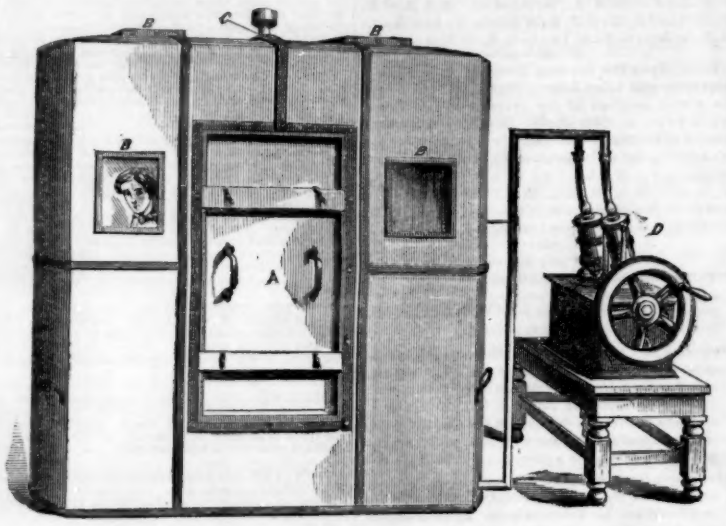
In pulmonic disease, the system languishes and death follows, not so much from a non-arterialization of the blood, as from *the forced state under which the system is compelled to labor in order to attain air.* If now, we increase the access of air, not by any forced or voluntary efforts that the system can illy afford, but by increasing its density by compression, in the supposed case, by one-third of an atmosphere, there will be an equilibrio between the vital wants and the supply, the duty of health will be performed, and the most perfect condition secured for the restoration of diseased parts. The objects of health are attained by the Compressed Air Bath, without stimulating and wasting the powers of life, but by husbanding them; the excited heart's action decreases, and the system is refreshed.

The following cut represents the apparatus we employ for the application of the Compressed Air Bath. The little room, A B, is made of tinned iron, manufactured for this special purpose, well riveted and strongly bound in each direction with strong iron bands, the whole rendered completely air tight by soldering. Several movable rods or stays, with hooks at the end, extend across the inside, and prevent the sides from being torn asunder by the inside pressure. A is a door well packed with soft rubber at the edges, so as to be completely air tight; B B are windows, and C is a valve that gives egress to the confined air, and by means of weights placed upon it the pressure per square inch is measured in the same manner as by the safety valves of steam boilers. D represents two force pumps of brass, acting reciprocally by means of gearing within the iron box upon which they are placed, operated by a band upon a pulley, or by hand. The air pumps, however, with the power operating them, are placed in another room, and a communication is had by means of a strong rubber hose, whereby all noise of machinery is effectually prevented.

One, two, or more patients having entered the bath, and the door being secured, the pumps are set in action and the air forced into the room accumulates until it escapes by the valve, C, but the pressure is gradually raised by adjusting weights upon the valve until in the course of twenty or thirty minutes it attains three or four pounds to the square inch. The pumps being kept in continued action, the pressure is suffered to remain at about this point for an hour and a half, when the pressure is gradually removed.

Effects of the Bath.—Those immediately noticeable are pressure upon the ear drum, immediately relieved by attempting to swallow an elevation of temperature of a few degrees, sometimes a slight sensation of chilliness, and if the respiratory organs be diseased, a remarkable ease and freedom of respiration, and when the voice is tried its powers are so restored as to surprise the patient, an effect which continues after the bath is ended, and what, more than anything else, is the key to its good effects, a *fall of the pulse*, sometimes to the extent of twenty-five or thirty beats per minute. The healthy who try the experiment, on the contrary, sometimes experience an elevation of the pulse, but no diminution. This effect upon the pulse seems also to be permanent.

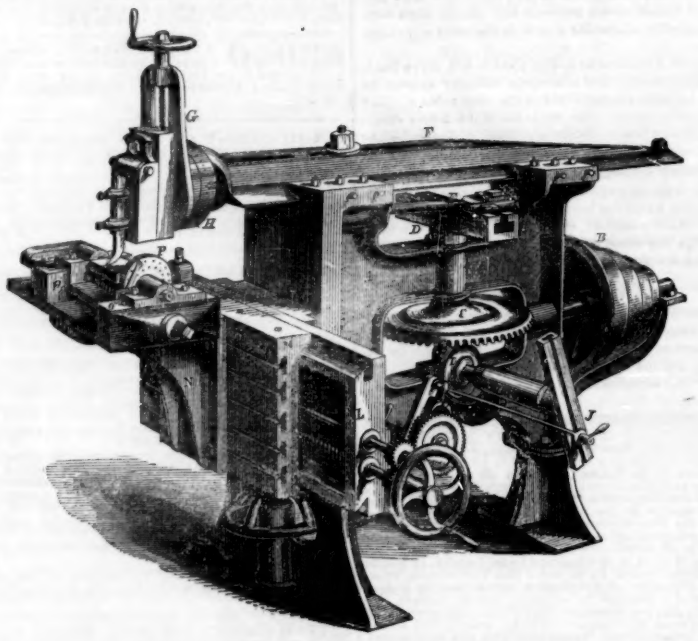
DR. TAYLOR'S COMPRESSED AIR BATH.



The Compressed Air Bath will doubtless prove an available and efficient means of arterializing the blood of that class of invalids whose condition precludes exercise. Experience proves that congestion and arrested capillary action, though formidable, are overcome, when the quality of the blood is corrected by this auxiliary respiration, and there can be no doubt but that this recourse will be found serviceable in many diseases depending upon similar causes, besides those of the respiratory organs.

G. H. TAYLOR, M. D.
650 Sixth avenue, New York.

PLASS' COMPOUND PLANER.



The accompanying engraving represents a tool principally designed for planing the smaller class of work, and irregular shapes which are inconvenient or impossible to hold on the ordinary iron planer, but can be griped in a vice, such as stub-ends, straps, gibs, keys, cams, &c. All such pieces as require to be planed in different directions, and still preserve a perfectly level surface, can be finished in this machine with great accuracy, and without letting go of the work until all parts of the plane surface are perfected. The work is firmly held in a vice made to swivel around in any position without loosening its hold. The tool as generally proportioned is capable of holding and planing a piece twelve inches wide and thirty inches long, turning the same in any position required.

A is the frame or body of the machine which is cast in one piece, thus obviating all bolting or yielding under the strains applied in cutting. B is the driving pulley; C is a bevel wheel driven by a pinion on the shaft of B, and gives motion by the aid of D and E as represented, to the tool stock and slide, F; I is one of a pair of mitre wheels operating the feed motion attached to the adjustable transverse ways, L. By means of the feed screw, L, it operates the slide, M; N is a right angle bracket secured to slide, M, and supporting the swivel vice, O and Q, in which the work to be planed is held, and which constitutes the principal novel feature of the machine. The vice is set in a recess, N, and is firmly secured in any desired position by one large bolt and nut not represented (being on the under part of angle bracket, N.) The unscrewing of this nut allows the vice with work secured in it to be turned in any direction required, without changing its plane. P is a pair of centers with index thereon, to aid in planing nuts or other articles of irregular shape. Thus by rotating the vice, the two jaws of which are represented by O and Q upon the angle plate or angle bracket, N, the work may be rotated to any desired extent horizontally, and by mounting the work in the centers, P, it may also be revolved to any extent desired vertically. The tool stock, G, can also be set by the aid of index H, so as to feed the tool down at any angle required, and by properly managing all these adjustable parts almost any plane surfaces may be finished with perfect accuracy without once letting go the hold.

For planing cylindrical surfaces, or what is ordinarily termed circular planing, the bracket, N, with all its attachments, is removed, and the work is mounted on a revolving stud supplied in its place and passing through slide, M, so that it can be slowly rotated by the feed, L, which acts on a worm wheel not represented.

The tool slide, F, can be set to any stroke from one to twelve inches, and the cross slide, M, with its attachments, can be raised or lowered by raising or lowering the transverse ways, L. This is accomplished by slackening the nuts at the back, and simply turning the hand wheel seen underneath.

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